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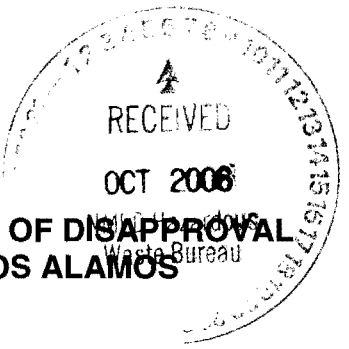
Date: October 6, 2006
Refer to: EP2006-0887

Mr. James Bearzi
NMED-Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505-6303



SUBJECT: SUBMITTAL OF THE RESPONSE TO THE "NOTICE OF DISAPPROVAL FOR INVESTIGATION WORK PLAN FOR UPPER LOS ALAMOS CANYON AGGREGATE AREA"

Dear Mr. Bearzi:

Enclosed please find two hard copies with electronic files of the response to the "Notice of Disapproval for Investigation Work Plan for Upper Los Alamos Canyon Aggregate Area."

If you have questions, please contact Becky Coel-Roback at (505) 665-5011 (becky_cr@lanl.gov) or Bob Enz at (505) 667-7640 (renz@doeal.gov).

Sincerely,

Andrew Phelps, Associate Director,
Environmental Programs
Los Alamos National Laboratory

Sincerely,

David Gregory, Federal Project Director
Department of Energy
Los Alamos Site Office

7796

AP/DG/BCR/ew

Enclosure: Two hard copies with electronic files – "Notice of Disapproval for Investigation Work Plan for Upper Los Alamos Canyon Aggregate Area" (EP2006-0857)

Cy: (w/ enc):
B. Coel-Roback, EP-CAP, MS M992
R. Enz, DOE LASO, MS A316 (with CD)
L. Causey, LATA (with CD)
EP-CAP File, MS M992 (with CD)
RPF, MS M707 (with CD)
SAFE S-7, MS F674 (without CD)

Cy: (Letter & CD only)
L. King, EPA Region 6
P. Reneau, EP-ERSS, MS M992

Cy: (w/o enc)
A. Dorries, ERSS, MS M992
G. Dover, EP-CAP, MS M992
D. McInroy, EP-CAP, MS M992
A. Phelps, ADEP, MS J591
C. Mangeng, ADEP, MS J591
D. Gregory, DOE LASO, MS A316
T. Skibitski, DOE-OB
IRM-RMMSO, MS A150

Response to the "Notice of Disapproval for Investigation Work Plan for the Upper Los Alamos Canyon Aggregate Area, Los Alamos National Laboratory EPA ID No: NM0890010515, HWB-LANL-06-012," Dated August 22, 2006

INTRODUCTION

To facilitate review of this response, the New Mexico Environment Department's (NMED's) comments are included verbatim. The comments are divided into general and specific categories, as presented in the notice of disapproval. Los Alamos National Laboratory's (LANL's or the Laboratory's) responses follow each NMED comment. This response contains data on radioactive materials, including source, special nuclear, and by-product material. Information on radioactive materials and radionuclides, including the results of sampling and analysis of radioactive constituents, is voluntarily provided to NMED in accordance with U.S. Department of Energy policy.

GENERAL COMMENTS

NMED Comment

1. *To facilitate the review, please provide a map of Upper Los Alamos Aggregate area depicting existing and proposed sampling locations for the entire aggregate.*

LANL Response

1. The requested map of Upper Los Alamos Aggregate Area depicting previous and proposed sampling locations for the entire aggregate is provided as Plate 1. For clarity, a map showing the former and proposed sampling locations for Technical Area (TA) 01 is also provided (Plate 2).

NMED Comment

2. *Most of the area being investigated has been disturbed in the past due to various development and construction activities. Several feet of fill has been placed at some sites at different times in the past. The United States Department of Energy/Los Alamos National Security (collectively the Permittees) must take measures to ensure that samples being collected are not from the fill but from the appropriate soil/tuff media that was potentially affected by historical laboratory operations. The selection of appropriate sampling locations and depths should be documented and provided in the report.*

LANL Response

2. Section 1.3 of the work plan, entitled "Phased Approach of Field Activities," addresses the sites that have been affected by development and indicates that engineering drawings, previous documentation, geophysical methods, and trenching will be used to determine the original locations and depths of the removed structures. This approach will ensure that environmental media potentially affected by historical operations are sampled rather than the clean fill emplaced after historical operations ceased (please see footnotes to the sampling tables defining zero depth). In addition, the soil/tuff interface will be sampled to ensure that impacts to in-place media are fully evaluated.

In the case of Solid Waste Management Unit (SWMU) 01-003(a), the Bailey Bridge landfill, the fill emplaced during historical operations will also be sampled to determine if it was contaminated.

SPECIFIC COMMENTS

NMED Comment

1. Section 3.1.1.1, Underground Industrial Waste Lines, Page 11:

SWMU 0-017 comprises of 39,000 feet of underground acid/industrial waste line and associated sumps and pumps that were used for transportation of radiological and chemical waste to various treatment facilities according to the 1990 SWMU report. The SWMU report further states that the lines and associated structures have become contaminated. The RFI Report for Potential Release Site 0-017 (July 1999) only addressed former Line 167, Lines 170 and 171, and manhole ULR 33—not the entire SWMU. In response to NMED's Request for Supplemental Information, LANL withdrew its no further action (NFA) request for SWMU 0-017 in April, 2000.

An underpinning of WP is that only Lines 170 and 171 remain of the former waste lines and Lines 170 and 171, former Line 167 and manhole ULR 33 are designated as SWMU 0-017. No documentation has been provided that shows when this designation was made and who authorized it. To back up the assertion, the Permittees must provide an updated map of the entire length of underground acid/waste line system, depicting locations of former and existing lines.

Historical Investigation Report for Upper Los Alamos Canyon Aggregate Area (HIR), April, 2006, does not provide sufficient details of past removal activities. It appears from the HIR that after removal of sections of the waste lines, only radiological screening was done to determine the nature and extent of contamination; no laboratory analysis were performed for radiological or hazardous constituents. Although, the waste lines were also used for the transport of chemical wastes, and the leaks from waste lines and sumps had been documented, the nature and extent of hazardous constituents was never investigated. The "Radioactive Liquid Waste Lines Removal Project at Los Alamos (1981-1986)," which documents the historical removal of portions of waste lines, states that approximately 46 items were left in place, consisting of total waste line length of about 6000 ft. Please provide updated information on the portions of waste lines that were not removed in 1981-1986 and any lines that may have been removed later. Investigation of only a portion of SWMU is not sufficient to make a determination regarding whether corrective action is complete for the entire SWMU.

LANL Response

1. A map of the industrial waste lines in the areas of Upper Los Alamos Canyon Aggregate and Pueblo Canyon Aggregate is provided (Plate 3). This map depicts the locations of former and existing line sections. Detailed information on the lines removed and those left in place is provided in Attachment 1.

   LANL proposes conducting the sampling at SWMU 00-017, as presented in the Upper Los Alamos Canyon Aggregate Area work plan, with the understanding that characterization of this limited portion of the waste line is not sufficient to make a decision regarding potential corrective actions for the entire SWMU. The rest of the waste lines cut across several aggregate areas and are outside the scope of the Upper Los Alamos Aggregate Area work plan. Many sections of line (or former locations of line) run beneath structures, utilities, or roadways, and few have been characterized with fixed-

laboratory data. The industrial waste lines and associated structures merit a more comprehensive approach to characterize potential contamination and determine the need for any further corrective action. Therefore, LANL would like to meet at NMED's convenience to discuss a technical approach and schedule for this effort.

NMED Comment

2. Section 3.1.2, Summary of Releases, Transport Mechanisms, and Potential Receptors, page 11:

The WP states that SWMU 00-017 is part of underground industrial waste lines. As explained in the comment #2, SWMU 00-017 is comprised of the entire waste line system not just a portion of it. Revise the text accordingly.

LANL Response

2. The revised work plan text is as follows:

3.1.2 Summary of Releases, Transport Mechanisms, and Potential Receptors

A summary of contaminant releases, transport mechanisms, and potential receptors is presented separately, based on operational histories, to address SWMU 00-017, which is the underground industrial waste lines, and to address AOCs 00-031(a), 00-031(b), and C-00-042, which are associated with the operations of the Zia Company. No contaminant release or transport, and hence no potential receptors, is associated with AOC 00-034(b).

3.1.2.1 Underground Industrial Waste Lines

Summary of Releases. The waste lines and associated sumps and pumps transported contaminated liquid wastes generated by Laboratory operations to various treatment facilities. The lines and associated structures were contaminated as a result (LANL 1990, 07511). Contamination of the soil and/or tuff in the surrounding environment was found while excavating the pipes and associated structures, such as manholes (DOE 1979, 08897, pp. 24–36; Elder et al. 1986, 06666, pp. 24–55).

Transport Mechanisms. Contamination associated with the waste lines may have been released to the environment as a result of leaks from sections of pipe or from associated structures such as manholes. Also, contaminants may have migrated to the surface water and to the alluvial groundwater in Los Alamos Canyon. Other transport mechanisms that may lead to exposure of potential receptors include

- infiltration of water through the vadose zone,
- continued dissolution and advective/dispersive transport of potential chemical and radiological contaminants contained in subsurface soil and bedrock,
- soil erosion leading to exposure of subsurface contaminants, and
- site disturbance through human activities.

Potential Receptors. Potential receptors to contaminant exposure include

- commercial and laboratory workers,

- trail users in the canyons below the mesa top, and
- ecological receptors in the undeveloped areas (i.e., hillsides).

NMED Comment

3. Section 3.2.1, Summary of Previous Investigations for SWMU 00-017, Page 13:

RFI report for SWMU 00-017 (LANL 1999, 64029) reports 45 samples from 29 locations were analyzed at off-site laboratory not 40 samples from 26 locations as reported in the WP. Resolve the discrepancy and revise the WP and HIR accordingly.

LANL Response

3. Note that Table 2.3-2 of the Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) report (LANL 1999, 64029) lists 46 samples, excluding duplicates, not 45, as indicated in NMED's comment.

   The discrepancy is resolved as follows. Six samples and three locations were eliminated in the work plan for the following reasons:

   - Both samples from location 00-10125 (RE00-98-0051 and -0052) and a sample from location 00-10126 (RE00-98-0053) were collected from the trackhoe bucket (LANL 1999, 64029, p. 15). They were omitted from the work plan because they were considered not-in-place samples. The deeper sample at location 00-10126 was retained because it was collected at this location using a drill rig.
   - Sample RE00-98-0097 at location 00-10142 is a composite sample (LANL 1999, 64029, p. 24); therefore, this sample and its duplicate were eliminated.
   - Sample RE00-99-0001 at location 00-10177 and sample RE00-99-0002 at location 00-10178 do not have location coordinates associated with them; therefore, they are not useable.

   The three samples collected from the trackhoe bucket (RE00-98-0051, -0052, and -0053, all from the mesa top) should have been included in the work plan because valid location coordinates are available for location 00-10125.

   The revised work plan text follows, and the revised table (Table 3.1-1) and figure (Figure 3.2-1) are included in Attachments 2 and 3, respectively.

3.2.1 Summary of Previous Investigations for SWMU 00-017

Samples analyzed at off-site fixed laboratories included 43 soil, fill, sediment, and tuff samples collected from 27 locations at SWMU 00-017 (Figure 3.2-1, Table 3.1-1). Samples from the 11 locations (00-10141, 00-10143 through 00-10146, and 00-10179 through 00-10184) at former line 167 were collected from depths of 0.1 to 9 ft. Samples from the 15 locations at line 170 and line 171 (00-10126 through 00-10140) were collected from depths of 12.5 to 27.5 ft, depending on the depth of the pipe. The suites analyzed for each sample are provided in Table 3.1-1.

NMED Comment

4. Section 3.2.2, Summary of Data for SWMU 00-017, Page 13-14:

Chromium was retained as a chemical of potential concern (COPC) in the RFI Report because it was detected in two samples at concentrations greater than background values. The WP states that it was detected within the range of background concentrations implying that it is not retained as a COPC. Please explain the discrepancy.

The WP states that no organic chemicals were detected, even though Aroclor 1254 was detected at location 00-10125 (according to the RFI Report). Resolve the discrepancy and revise the text accordingly.

According to the RFI Report, cesium-137 was detected at location 00-10125 at 3.27mg/kg (18.5-19 ft) and americium-241 was detected at two locations. The WP states that lateral extent is defined for all radionuclides in the canyon portion of SWMU 00-017, even though the lateral extent for cesium-137 and americium-241 is not defined, and both of these radionuclides were retained as COPCs in the RFI Report. Sampling location 00-10125 is not depicted on the Figure 3.2-1. Provide an explanation for not including results from sampling location 00-10125 in the WP, or modify the WP accordingly.

LANL Response

4. Three concerns are associated with Comment 4.

   (1) The first concern is the concentrations of chromium detected. Chromium was detected at concentrations greater than background value (BV) in tuff (7.14 mg/kg) but within the range of concentrations in the background dataset. Both the statement in the RFI report and in the work plan are correct. However, because chromium was detected at concentrations within the range of the background data set (maximum of 13 mg/kg), chromium was not identified in the work plan as a chemical of potential concern (COPC).

   (2) The second concern is the detection of Aroclor-1254 at location 00-10125. Aroclor-1254 was detected in the shallow sample at location 00-10125 but not in the deep sample. As explained in the response to specific comment 3, samples from location 00-10125 were omitted in error.

   (3) The third concern is the detection of cesium-137 and americium-241 at location 00-10125 and the determination of lateral extent for radionuclides in the canyon portion of SWMU 00-017 (LANL 1999, 64029, p. 47). With the inclusion of location 00-10125, cesium-137 and americium-241 will be identified as COPCs (see response to specific comment 3). Table 2.3-9 in the RFI report indicates that cesium-137 and americium-241 each were detected in three samples, all of which were mesa-top locations, not canyon locations. Therefore, the statement in the work plan regarding the lateral extent of contamination for the canyon portion is correct. In the two samples collected at location 00-10125, all radionuclides showed a decreasing trend with depth (LANL 1999, 64029, p. 47, Table 2.3-9). Concentrations of americium-241 and cesium-137 decreased to below detectable levels in the deep sample. The revised work plan text follows.

3.2.2 Summary of Data for SWMU 00-017

- Samples from 21 locations (00-10125 through 00-10141 and 00-10143 through 00-10146) were analyzed for cyanide and metals; samples from six locations (00-10179 through 00-10184) were analyzed only for lead. Analytical results indicated that

aluminum, arsenic, barium, beryllium, calcium, chromium, cobalt, copper, cyanide, iron, lead, magnesium, mercury, nickel, and vanadium were detected at concentrations greater than BVs in at least one sample between 0.1 and 27.5 ft below ground surface (bgs). Arsenic, beryllium, chromium, iron, and vanadium were detected within the range of the background concentrations. Aluminum, barium, calcium, copper, lead, magnesium, and nickel were detected greater than the range of the background concentrations.

- Samples from 21 locations (00-10125 through 00-10141 and 00-10143 through 00-10146) were analyzed for polychlorinated biphenyls (PCBs), pesticides, and semivolatile organic compounds (SVOCs); samples from 17 locations (00-10126 through 00-10141, and 00-10146) were analyzed for VOCs. Only Aroclor-1254 was detected at location 00-10125.
- Samples from 21 locations (00-10125 through 00-10141 and 00-10143 through 00-10146) were analyzed for isotopic plutonium, isotopic uranium, and tritium and by gamma spectroscopy. Analytical results indicated that americium-241, cesium-137, plutonium-238, plutonium-239, and tritium (soil FV not available) were detected at depths in soil/fill/tuff where FVs do not apply, or greater than the sediment FV (all depths), and uranium-235 was detected at an activity greater than BV, in at least one sample collected between 0.1 and 27.5 ft bgs. Uranium-235 was detected at an activity within the range of the background activities. Plutonium-239 and tritium were detected at activities greater than the range of the fallout activities.

Vertical extent of contamination on the mesa-top portion of SWMU 00-017 was not defined for aluminum, barium, calcium, cobalt, copper, lead, magnesium, mercury, and nickel. Because only one organic chemical was detected in the shallow sample at location 00-10125, the extent of organic chemicals on the mesa top is adequately defined. Except for uranium-235 at location 00-10126 and tritium at location 00-10139, vertical extent was defined for radionuclides on the mesa top where two depths were sampled. Lateral extent along the path of the pipeline on the mesa top is defined for all chemicals and radionuclides, except mercury, americium-241, plutonium-238, and plutonium-239 at the northeastern end of the pipeline.

NMED Comment

5. Section 3.3, AOC 00-031(a), Soil Contamination beneath Former Service Station, Page 15:

According to the 1992 Work Plan for OU 1071, there were three 25,000 gallon underground storage tanks (USTs) at the site that could have released potential contaminants (e.g. lead, solvents, oil and grease) to the environment, prior to the transfer to a private owner. No previous investigations have been conducted at the site. LANL (November 9, 1995) sent a letter to EPA stating that no investigation is warranted at the site because of the subsequent commercial use of the property by private owner for twenty years. In response, EPA (December 6, 1995) asked DOE to clarify whether the site was their responsibility. It is not clear from the WP that the issue of 'responsible party' raised by EPA was ever addressed. Even though DOE concurred with LANL's no further action (NFA) recommendation in 1998, NMED does not consider DOE to be the appropriate authority to make a NFA determination for the site that may have RCRA constituents. NMED considers LANL responsible for the investigation of the USTs that were used by LANL and may have contributed to the release of contaminants to the environment. Include investigation of AOC 00-031(a) in the WP or provide documentation that corrective action at the site has been completed or is no longer needed.

LANL Response

5. An investigation will be conducted at Area of Concern (AOC) 00-031(a), contingent upon permission from the current property owner. Investigation methods provided in Section 10.1 of the work plan will be followed to establish the former locations of the underground fuel tanks (e.g., use of drawings and inspections, appropriate geophysical techniques, and/or excavation). Once the locations of the tanks have been established, a step-out borehole sampling approach will be used to characterize any potential contamination from the tanks. If the tanks cannot be located, or if they are found beneath a structure, LANL will confer with NMED to determine the path forward for AOC 00-031.

NMED Comment

6. Section 3.4.2, Summary of Data for AOC 00-031(b), Page 16:

Lead was detected above background in number of samples collected during RFI investigations (August, 1996), but was not identified as a COPC in the WP. Provide documentation of NMED approval of the cleanup of the site or include lead as a COPC.

LANL Response

6. The following information is based on Section 5.1.5 of the RFI report (LANL 1996, 54913).

    - At underground storage tank (UST) 1, one sample was analyzed for lead by x-ray fluorescence (XRF) (field screening). This sample was collected from soil that was removed as part of the excavation of UST-1. Lead was not detected in this sample.
    - At UST-2, four samples were analyzed for lead, two by XRF (field screening) and their split samples by an off-site laboratory. These samples were collected from soil that has since been removed as part of the excavation of UST-2. The lead concentrations ranged from 41 to 83 mg/kg.
    - At the east auxiliary pipe, five soil samples were collected and analyzed for metals at an on-site laboratory; none were detected above their respective BVs.
    - At the concrete curb, ten soil samples were collected and analyzed at an on-site laboratory; three of the samples were analyzed for target analyte list (TAL) metals, and the remaining seven samples were analyzed only for lead. Lead was detected above BV in four samples at concentrations ranging from 26 to 44 mg/kg.
    - At the distribution line, 44 soil samples were collected and analyzed for lead at an on-site laboratory. Based on the statistical tests performed to compare site and background data, lead concentrations at the distribution line are not statistically elevated above background level.

    All except three of the above samples were eliminated from the all-analyses data table because the results were from field screening or an on-site laboratory or they were excavated during the UST removal. The three remaining samples, collected at locations 00-01602, -01613, and -01614 at the concrete curb, were retained in the data table as decision-level data. These samples show no detection of lead. Based on the data from the excavation and those generated by on-site analysis and field screening, lead concentrations in soil at AOC 00-031(b) are significantly below the residential soil screening level (SSL) of 400 mg/kg.

Although LANL has not received approval of the cleanup from NMED, the source of contamination at AOC 00-031(b) has been removed, and there is no indication of residual contamination above residential SSLs. Further, no pathways for contaminant transport and no complete pathway for exposure to human or ecological receptors exist at the site (LANL 2006, 91916, p. 17, Section 3.4.3). Based on the absence of pathways and the relative inaccessibility of the site for drilling, no sampling activities are proposed for AOC 00-031(b).

NMED Comment

7. Section 4.2, Scope of Activities for SWMU 01-001(a), Page 22:

It is not clear if sampling is proposed for the entire length of the drainage. Samples must be collected along the entire length of drainage to the toe of colluvium because contamination may have migrated to the canyon bottom over time. Sample locations must be selected based on geomorphic relationships and sedimentary packages following canyon investigation procedures.

LANL Response

7. Because no discernable drainage exists at SWMU 01-001(a) to sample, a phased approach was agreed upon in the July 25, 2006, meeting between Neelam Dhawan (NMED) and Becky Coel-Roback (LANL). At this SWMU, sampling will focus on the outfall area. If the results indicate contamination, a phased sampling strategy will be used to plot a path down the canyon to the toe of the slope or until the downgradient extent of contamination is defined.

NMED Comment

8. Section 4.3, Scope of Activities for SWMU 01-001(b), Page 24:

See specific comment #7.

LANL Response

8. See response to specific comment 7.

NMED Comment

9. Section 4.14.3, Scope of Activities for SWMU 01-003(a), Page 43:

Contaminated debris from Sigma Building was disposed of at SWMU 01-003(a) and covered with 4 ft of earthen fill. Additional fill was deposited at the site when area was developed for housing. Explain how the proposed depths for samples to be collected from the area overlain by fill (i.e., 0-0.5 ft and 2.0-3.0 ft) will be adequate to define the nature and extent of contamination at the site.

The proposed depths will likely result in collecting samples from the clean fill. The Permittees must collect additional samples from greater depths to ensure potentially contaminated soil is targeted.

LANL Response

9. At SWMU 01-003(a), locations 2 and 4 are situated within the demolition-debris/fill area. Samples will be collected from locations 2 and 4 at 0 to 0.5 ft and then every 5 ft (or less) until the fill/tuff interface

is reached. A sample will also be collected at the soil/tuff interface. This sampling strategy will allow for characterization of the demolition-debris fill and as well as definition of vertical extent. The revised work plan text follows, and the revised table (Table 4.14-1) is included in Attachment 2.

4.14.3 Scope of Activities for SWMU 01-003(a)

The proposed sampling locations at SWMU 01-003(a) are shown in Figure 4.14-1. Table 4.14-1 provides a summary of the proposed sampling locations, depths, the objectives each sample addresses, and the proposed analytical suites. Sampling at SWMU 01-003(a) will be contingent upon access and permission by the landowner and will consist of the following activities:

- *Area of Landfill.* Because the northern portion of the SWMU is currently under a building and pavement, no samples will be collected in the northern portion of the SWMU. Samples will be collected at the back of the building and on the hillside near the former bridge/old perimeter road (Figure 4.14-1, locations 1 and 2). Two sampling locations will be situated approximately 50-ft downgradient of locations 1 and 2 (Figure 4.14-1, locations 3 and 4). Samples will be collected from the 0- to 0.5-ft- and 2.0- to 3.0-ft-depth intervals at locations 1 and 3. Little to no fill material occurs at these two locations because the soil is shallow as a result of the rocky outcrops associated with the steep canyon terrain. At locations 2 and 4, samples will be collected from 0- to 0.5-ft bgs and every 5 ft (or less), until the tuff is reached, to characterize the demolition-debris fill. One more sample will be collected at the fill/tuff interface at locations 2 and 4 to define extent. The eastern portion of the SWMU area will be sampled during the investigation of the outfalls at SWMU 01-001(o) (Section 4.9.3) and SWMU 01-006(o) (Section 4.27.3).

NMED Comment

10. Section 4.15.3, Scope of Activities for SWMU 01-003(b), Page 44:

The disposal area may be covered with fill. Proposed samples that will be collected at the disposal area may not be adequate to define the nature and extent of contamination at the site. The proposed depths (i.e., 0-0.5 ft and 2.0-3.0 ft) for sample collection may result in samples being collected from the clean fill. The Permittees must collect additional samples from greater depths to ensure potentially contaminated soil is sampled.

LANL Response

10. See response to general comment 2. The intent is to sample historical media and to determine the extent of contamination. If fill is present, the 0- to 0.5-ft sample will be collected from historical media, not from fill. Because of the shallow bedrock in this area, the 2.0- to 3.0-ft sample is expected to be collected beneath the soil/tuff interface. The text in the work plan has been clarified to indicate sample depths from historical media and at the soil/tuff interface. The revised text is as follows:

4.15.3 Scope of Activities for SWMU 01-003(b)

To locate and characterize this SWMU, a walk-over geophysical survey will be conducted. If no geophysical anomalies are found indicating a concentrated area of disposal, no samples will be collected. If the walk-over geophysical survey identifies anomalies indicating a concentrated area of disposal, samples will be collected to define the nature and extent of potential contamination. These samples will be collected at one location in the middle of the anomaly, and one each to the north,

east, south, and west of the perimeter of the anomaly. At each location, samples will be collected at the 0- to 0.5-ft interval, with zero being the depth of the historical media, every 5 ft (or less) to the soil/tuff interface, and at the soil/tuff interface.

NMED Comment

11. Section 4.17.2, Summary of Data for SWMU 01-003(d), Page 45:

The data from 1992, Phase I RFI investigations, indicate very high detection limits for antimony. The WP states that the downgradient lateral extent has been defined for antimony. It is not clear how the lateral extent for antimony is considered defined when sample detection limits that were much greater than the background values. Similar statements have been made for other SWMUs and other COPCs throughout the document. However, proposed sampling locations in this WP would probably result in defining the lateral extent for these SWMUs.

LANL Response

11. Comment noted.

NMED Comment

12. Section 4.28.3, Scope of Activities for SWMU 01-007(a) and Adjacent SWMUs 01-006(b,n), Page 56:

WP states that samples in the area of SWMU 01-007(a) does not need to be analyzed for cyanide, nitrates, perchlorate and organic chemicals. Building D was primarily used for processing plutonium, and solvents, and other chemicals also may have been used in the building. Because 1997 investigations carried out by Ahlquist focused only on radiological survey and contamination, it should not be assumed that other contaminants were not present. Sample analysis must include cyanide, nitrate, perchlorate, organic chemicals and gamma analysis.

LANL Response

12. Samples collected in the area of SWMU 01-007(a) will be analyzed for cyanide, nitrates, perchlorate, organic chemicals and gamma-emitting radionuclides. The revised work plan text follows, and the revised table (Table 4.28-1) is included in Attachment 2.

4.28.3 Scope of Activities for SWMU 01-007(a) and Adjacent SWMUs 01-006(b,n)

Samples in the area of SWMU 01-007(a) will be analyzed for TAL metals, cyanide, nitrates, perchlorate, organic chemicals, americium-241, isotopic plutonium, isotopic uranium, strontium-90, tritium, moisture, pH, and gamma-emitting radionuclides.

NMED Comment

13. Section 4.31.3, Scope of Activities for SWMU 01-007(d), Page 59:

The WP states that samples in the area of SWMU 01-007(d) will not be analyzed for cyanide, nitrate, perchlorate and organic chemicals. Soil contamination was found around buildings H and Theta and was due to overflow of industrial waste line. Because previous investigations focused only on

radioactive contamination, it should not be assumed that other contaminants are not present. Sample analysis must include cyanide, nitrate, perchlorate, and organic chemicals.

LANL Response

13. Samples collected in the area of SWMU 01-007(d) will be analyzed for cyanide, nitrates, perchlorate, organic chemicals and gamma-emitting radionuclides. The revised work plan text follows, and the revised table (Table 4.31-1) is included in Attachment 2.

4.31.3 Scope of Activities for SWMU 01-007(d)

Samples in the area of SWMU 01-007(d) will be analyzed for TAL metals, cyanide, nitrates, perchlorate, organic chemicals, americium-241, isotopic plutonium, isotopic uranium, strontium-90, tritium, moisture, and pH and by gamma spectroscopy.

NMED Comment

14. Section 4.32.3, Scope of Activities for SWMU 01-007(e), Page 60:

The WP states that samples in the area of SWMU 01-007(e) will not be analyzed for inorganic and organic chemicals. COPCs associated with SWMU 01-007(e) were radionuclides, solvents and metals (1996 RFI Report, page 30). Because previous investigations focused only on radioactive contamination, it should not be assumed that other contaminants are not present. Sample analysis must include metals, cyanide, nitrate, perchlorate, and organic chemicals.

LANL Response

14. Samples collected in the area of SWMU 01-007(e) will be analyzed for metals, cyanide, nitrates, perchlorate, organic chemicals and gamma-emitting radionuclides. The revised work plan text follows, and the revised table (Table 4.32-1) is included in Attachment 2.

4.32.3 Scope of Activities for SWMU 01-007(e)

Samples in the area of SWMU 01-007(e) will be analyzed for TAL metals, cyanide, nitrates, perchlorate, organic chemicals, americium-241, isotopic plutonium, isotopic uranium, strontium-90, tritium, moisture, and pH and by gamma spectroscopy.

NMED Comment

15. Section 4.33.3, Scope of Activities for SWMU 01-007(j), Page 63:

The WP states that samples in the area of SWMU 01-007(j) will not be analyzed for inorganic and organic chemicals. Sources of contamination at SWMU 01-007(j), comprised of twelve areas of suspected subsurface contamination, are not known. Subsurface contamination observed in these areas likely resulted from leaks from industrial waste lines that originated at and were connected to various buildings at TA-1. Industrial waste lines from these buildings transported chemical as well as radioactive materials. Previous investigations focused only on radioactive contamination, however, it should not be assumed that other contaminants are not present. Additionally, 1996 RFI Report listed metals including chromium as COPC (page 50). Sample analysis must include metals, cyanide, nitrates, perchlorate, and organic chemicals.

LANL Response

15. Samples collected for SWMU 01-007(j) will be analyzed for metals, cyanide, nitrates, perchlorate, organic chemicals and gamma-emitting radionuclides. The revised work plan text follows, and the revised table (Table 4.33-1) is included in Attachment 2.

4.33.3 Scope of Activities for SWMU 01-007(j)

Samples in the area of SWMU 01-007(j) will be analyzed for TAL metals, cyanide, nitrates, perchlorate, organic chemicals, americium-241, isotopic plutonium, isotopic uranium, strontium-90, tritium, moisture, and pH and by gamma spectroscopy.

NMED Comment

16. Section 6.2.3, Scope of Activities for SWMU 32-001, Page 73:

Vertical extent for previous sampling locations was not defined. Include an additional sample location in the center of the base of former incinerator and collect samples from at least 0-1.0 ft and 2.0 to 3.0 ft below ground surface. If field screening during sample collection indicates the presence of contaminants, then samples must be collected from greater depths to define the vertical extent.

LANL Response

16. At SWMU 32-001, an additional sampling location will be situated in the center of the base of the former incinerator, and samples will be collected from the 0- to 1.0-ft and 2.0- to 3.0-ft depths. If field screening during sample collection indicates the presence of contaminants, samples will be collected from greater depths to ensure that vertical extent is defined. The revised work plan text follows, and the revised table (Table 6.2-1) and figure (Figure 6.2-1) are included in Attachments 2 and 3, respectively.

6.2.3 Scope of Activities for SWMU 32-001

The proposed sampling locations at SWMU 32-001 are shown in Figure 6.2-1. Table 6.2-1 provides a summary of the proposed sampling locations, depths, the objectives each sample addresses, and the proposed analytical suites. Sampling at SWMU 32-001 will consist of the following activities:

- *Incinerator Location.* One sampling location will be situated approximately 6 ft to the north, south, east, and west of the incinerator pad, and one sampling location will be in the center of the incinerator pad for a total of five sampling locations (Figure 6.6-1, locations 1 through 5). Samples will be collected from the 0- to 1.0-ft- and 2.0- to 3.0-ft-depth intervals for a total of eight samples. The first interval will begin at 0.5 ft or deeper to avoid collecting the asphalt pavement. If fill is present, the first interval will begin immediately below the fill to sample historical soil and not fill. If field screening during sample collection indicates the presence of contaminants, samples will be collected from greater depths to define vertical extent.

Samples will be analyzed at off-site fixed laboratories for TAL metals, cyanide, nitrates, perchlorate, VOCs, SVOCs, PCBs, dioxins, furans, americium-241, isotopic plutonium, isotopic uranium, strontium-90, tritium, moisture, and pH and by gamma spectroscopy. Explosive compounds will not be analyzed because they would not have been burned in the incinerator.

NMED Comment

17. Section 6.3.3, Scope of Activities for SWMU 32-002(a), Page 75:

Location 32-06375 is the location of third highest lead concentration not second highest concentration as indicated in the text (530 mg/kg at location 32-06373 and at 110 mg/kg at location 32-06369). Mercury was detected at the highest concentration (43 mg/kg) at location 32-06373, not at location 32-06368. Location 32-06369 is not the location of highest lead concentration. Make appropriate corrections to the text. Move the location of proposed sample to be adjacent to previous sampling location 32-06373 instead of 32-06375.

LANL Response

17. Proposed sample 1 has been moved next to previous sampling location 32-06373 instead of 32-06375. The revised work plan text follows, and the revised table (Table 6.3-1) and figure (Figure 6.3-1) are included in Attachments 2 and 3, respectively.

6.3.3 Scope of Activities for SWMU 32-002(a)

The proposed sampling locations at SWMU 32-002(a) are shown in Figure 6.3-1. Table 6.3-1 provides a summary of the proposed sampling locations, depths, the objective of each sample, and the proposed analytical suites. Sampling at SWMU 32-002(a) will consist of the following activities:

- *Drain Line.* Previous samples were collected at only one depth at each location. Therefore, to determine extent, deeper sampling is proposed. Samples will be collected immediately adjacent to previous sampling locations 32-06373 (the location of the highest lead and mercury concentrations), 32-06369 (the location of the second highest lead and mercury concentrations), and 32-06371 (the location of highest concentrations of plutonium-239 and PAHs) (Figure 6.3-1, locations 1 through 3, respectively). Samples will be collected from the 0- to 1.0-ft and 2.0- to 3.0-ft-depth intervals. Zero depth is defined as immediately beneath the bed of the previously excavated pipe. Care will be taken that debris containing parking lot material or asphalt is not included in the sample.

NMED Comment

18. Section 6.4.3, Scope of Activities for SWMU 32-002(b), Page 77:

Location 32-06344 is the location of highest concentrations of lead, mercury, thallium, and plutonium-239, not location 32-06365 as indicated in the text. The lateral extent of contamination is not defined at the outfall area, as mercury was detected at the concentration of 12 mg/kg at location 32-06325 (the sample collected farthest down in the drainage). Mercury was detected at 303 mg/kg and lead at 1500 mg/kg at location 32-1016 (0-5 in) during Phase I activities according to 1996 Phase II and VCA report. Although approximately 1 cubic foot of soil was removed from location 32-1013 during Phase II activities to remove PCB contaminated soil, apparently no soil was removed from location 32-1016. Additional samples should be collected from former sampling location 32-1016, and from at least two depths to define the vertical extent. Even though a decreasing trend is evident from the limited number of samples collected in the past, higher concentration of contaminants may exist in the drainage downsteam at locations of sediment accumulation. Data from 1995 RFI, though of screening level quality, indicates presence of PCBs, and inorganic chemicals like lead and mercury at high concentrations. It is not clear if sampling is proposed for the entire length of

the drainage. Samples must be collected along the entire length of drainage to the toe of colluvium because contamination may have migrated to the canyon bottom over time. Sample locations must be selected based on geomorphic relationships and sedimentary packages following canyon investigation procedures.

LANL Response

18. Five concerns are associated with comment 18.

(1) The first concern is correcting the text regarding the locations of the highest concentrations of lead, mercury, thallium, and plutonium-239. The text regarding relative chemical concentrations has been deleted because the proposed sampling locations are next to, and deeper than, existing sampling locations.

(2) The second concern is the lateral extent of contamination in the outfall area. A sample will be collected downslope of location 32-06325, which will result sampling the entire length of drainage to the toe of the colluvium. The revised text follows, and the revised table (Table 6.4-1) and figure (Figure 6.4-1) are included in Attachments 2 and 3, respectively.

6.4.3 Scope of Activities for SWMU 32-002(b)

The proposed sampling locations at SWMU 32-002(b) are shown in Figure 6.4-1. Table 6.4-1 provides a summary of the proposed sampling locations, depths, the objectives each sample addresses, and the proposed analytical suites. Sampling at SWMU 32-002(b) will consist of the following activities:

- *Drain line.* The SWMU 32-002(b) drain line confirmation samples were collected from only one depth (the base of the trench after drainline removal) and had metals and radionuclides greater than background levels and detections of organic chemicals. Therefore, to determine extent, samples will be collected immediately next to previous sampling locations 32-06365, 32-06366, and 32-06377 (Figure 6.4-1, locations 1, 2, and 3). Two additional locations will be sampled: one will be approximately 50 ft downgradient of location 3 in the drain line path, and the other will be at the end of the pipeline, near the mesa edge (Figure 6.4-1, locations 4 and 5). Samples will be collected from the 0- to 1.0-ft- and 2.0- to 3.0-ft-depth intervals. Zero depth is defined as immediately beneath the bed of the previously excavated pipe. Care will be taken that debris containing parking lot material or asphalt is not included in the sample.
- *Septic tank.* One sampling location will be situated in the center of the septic tank excavation, one sample will be collected at a depth immediately beneath the fill, and a second sample collected 2 ft deeper (Figure 6.4-1, location 6). Samples will be collected on the perimeter of the excavation in the four directions at the soil/tuff interface (approximately 4 to 6 in. bgs) and 1 ft deeper (Figure 6.4-1, locations 7 through 10, respectively).
- *Outfall area.* One sampling location will be situated at the toe of the slope, downslope from location 32-06325 (Figure 6.4-1, location 11). The sediment sampling location will be selected by a geomorphologist, and at least two depth intervals will be sampled: one in the appropriate sediment unit(s) and one below the sediment/tuff interface.

The samples will be analyzed at off-site fixed laboratories for TAL metals, cyanide, nitrates, perchlorate, VOCs, SVOCs, PCBs, dioxins, furans, americium-241, isotopic plutonium, isotopic uranium, strontium-90, tritium, moisture, and pH and by gamma spectroscopy. The samples will not be analyzed for explosive compounds because they would not have been present in the sanitary sewage system of the medical facility.

(3) The third concern is the need to collect additional samples from location 32-1016 to define the vertical extent of mercury and lead. Phase II characterization sampling location 32-06312 is within 5 ft of the Phase I characterization sampling location 32-1016, as shown in Figure 3.3.2-1 in the Phase II and voluntary corrective action (VCA) report (LANL 1996, 59178, p. 29). Location 32-06312 was sampled at two depths (0 to 6 in and 6 to 12 in.), and vertical extent was demonstrated by decreasing concentrations or nondetects in the deeper sample (LANL 1996, 59178, pp. 32–33, Tables 3.3.3-2 and 3.3.3-3) for metals. In the 0- to 0.5-ft sample, lead was detected at 220 mg/kg and mercury at 48 mg/kg. In the 0.5- to 1-ft sample, lead was detected at 37 mg/kg and mercury at 6.4 mg/kg. Therefore, location 32-06312 has defined extent for the immediate area, and no additional sampling at location 32-1016 is necessary.

(4) The fourth concern is data from the 1995 RFI that indicate the presence of polychlorinated biphenyl (PCBs) and inorganic chemicals at high concentrations. All data (from both mobile chemical van and fixed laboratory) have been examined. Only one location (32-1013) had a concentration of Aroclor-1260 greater than the 1 mg/kg cleanup level. The September 1996 Phase II and VCA report for sites at TA-32 (LANL 1996, 59178) states

> the PCB Aroclor 1260 was detected during the Phase I investigation at 17 mg/kg at location 32-1013, near the mouth of the outfall pipe. Because this area of PCB contamination was very small (1 ft^3) and was easily accessible, remedial activities were conducted as a best management practice to address this small area of PCB contamination …Confirmation sampling in the outfall area focused on the elevated Aroclor 1260 identified during the Phase I investigation at location 32-1013. Approximately 1 ft^3 of soil was first removed from the area of sampling location 32-1013. Then, two samples were collected at depths of 1–10 in. and 10–12 in. from the base of the small excavation. These samples were analyzed for PCBs at the MCAL. Results of the confirmation sampling were compared to the cleanup level of 1 mg/kg for PCBs in surface soils. No values were greater than the cleanup level. (LANL 1996, 59178, Section 3.3.7)

The soil at the sampling location where Aroclor-1260 was detected at a concentration greater than 1 mg/kg was removed in the 1996 VCA. Additionally, the Upper Los Alamos Canyon Aggregate Area work plan proposes resampling in that location (sampling location 5, near the mouth of the outfall pipe) and analyzing the sample at off-site fixed laboratories for TAL metals, cyanide, nitrates, perchlorate, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), PCBs, dioxins, furans, americium-241, isotopic plutonium, isotopic uranium, strontium-90, tritium, moisture, and pH and by gamma spectroscopy.

(5) The fifth concern is the selection of sampling locations. The added outfall sample will be collected in the same manner as prescribed for outfall samples in the Upper Los Alamos Aggregate Area [e.g., SWMU 01-001(a)]: “Outfall sampling locations will be selected by a geomorphologist, and at least two depth intervals will be sampled: one in the appropriate sediment unit(s) and one below the sediment/tuff interface.”

NMED Comment

19. Section 6.5.3, Scope of Activities for AOC 32-003, Page 78:

It is not clear if sampling is proposed for the entire length of the drainage. Samples must be collected along the entire length of drainage to the toe of colluvium because contamination may have migrated to the canyon bottom over time. Sample locations must be selected based on geomorphic relationships and sedimentary packages following canyon investigation procedures. PCBs were detected in the storm water samples recently collected downgradient of the SWMU in Los Alamos Canyon by NMED OB. The data from 1995 RFI report (screening level data) indicates that lead and zinc were detected above background levels. Therefore, the Permittees must include metals in the analytical suite for all samples to be collected at AOC 32-003. Acetone and toluene were also detected at the site. Therefore, organic chemicals must be included in the analytical suite.

LANL Response

19. Two concerns are associated with comment 19.

(1) The first concern is sampling in the drainage. During the site walk on July 25, 2006, with Neelam Dhawan, Mark Cummings, and Ralph Ford-Schmid (NMED) and Becky Coel-Roback and John Wilcox (LANL), it was decided that the drainage from AOC 32-003 will be considered the same as the SWMU 32-002(b) drainage and that sample results from SWMU 32-002(b) will be used to characterize AOC 32-003.

(2) The second concern is the addition of metals and VOCs to the list of suites for which the samples will be analyzed. Metals and VOCs have been added to the list of suites. The revised work plan text follows, and the revised table (Table 6.5-1) is included in Attachment 2.

6.5.3 Scope of Activities for AOC 32-003

The proposed sampling locations at AOC 32-003 are shown in Figure 6.5-1. Table 6.5-1 provides a summary of the proposed sampling locations, depths, the objectives each sample addresses, and the proposed analytical suites. Sampling at AOC 32-003 will consist of the following activities:

- Samples will be collected at two depths (0 to 0.5 ft and 2.0 to 3.0 ft bgs) around the perimeter of the 32-003 excavation (Figure 6.5-1, locations 1 through 5) to bound the lateral extent of PCB contamination. Samples will be collected within the excavated area to bound vertical extent at depths immediately beneath the fill and one ft deeper (Figure 6.5-1, locations 6 through 11). These samples will be collected immediately downslope from six previous PCB screening locations with the highest PCB concentrations detected (1.62 to 4.83 mg/kg). The final location (Figure 6.5-1, location 12) is positioned in the center of the former location of the wood pile; samples will be collected beneath the fill and 1 ft deeper.

Samples will be analyzed at off-site fixed laboratories for metals, PCBs, pH, VOCs, and SVOCs. Other analyte suites will not be analyzed because these chemicals are not associated with transformers.

NMED Comment

20. Section 7.2.3, Scope of Activities for SWMU 41-001, Page 85:

It is not clear if sampling is proposed for the entire length of the drainage. Samples must be collected along the entire length of drainage to the toe of colluvium at the main channel because contamination may have migrated to the canyon bottom over time. Sample locations must be selected based on geomorphic relationships and sedimentary packages following canyon investigation procedures.

LANL Response

20. During the site walk on July 25, 2006, with Neelam Dhawan, Mark Cummings, and Ralph Ford-Schmid (NMED) and Becky Coel-Roback and John Wilcox (LANL), it was decided that two additional locations will be sampled to cover the entire area of the drainage within this canyon-bottom site. One of the additional locations is between the end of the septic system and the water treatment plant, and the other is at the end of the culvert by the ditch that parallels the road. The revised work plan text follows, and the revised table (Table 7.2-1) and figure (Figure 7.2-1) are included in Attachments 2 and 3, respectively.

7.2.3 Scope of Activities for SWMU 41-001

The proposed sampling locations at SWMU 41-001 are shown on Figure 7.2-1. Table 7.2-1 provides a summary of the proposed sampling locations, depths, the objectives each sample addresses, and the proposed analytical suites. Sampling at SWMU 41-001 will consist of the following activities:

- *Excavation of Sewer Line and Sampling Excavation Trench.* The sewer pipeline will be excavated and inspected for evidence of leaks. Samples will be collected from the 0- to 1.0-ft- and 2.0- to 3.0-ft-depth intervals along the excavation trenches (Figure 7.2-1, locations 1 and 2). Zero depth is defined as immediately beneath the bed of the excavated pipe.
- *Excavation of Septic Tank and Sampling Excavated Area.* The septic tank will be excavated and inspected for evidence of leaks (e.g., stained soil, holes in the tank). At the septic tank excavation, samples will be collected from the 0- to 1.0-ft- and 4.0- to 5.0-ft-depth intervals at the center of the floor of the excavation (Figure 7.2-1, location 4). Zero depth is defined as the floor of tank excavation. Additional soil samples will be collected immediately beneath the septic tank inlet (Figure 7.2-1, location 3) and outlet (Figure 7.2-1, location 5) from the 0- to 1.0-ft- and 2.0- to 3.0-ft-depth intervals.
- *Outfall.* The drain tile line, into which the tank emptied, cannot be visually located at the site. Samples will be collected from the 0- to 0.5-ft-, 1.5- to 2.0-ft-, and 4.0- to 5.0-ft-depth intervals at the end of the outlet pipe (Figure 7.2-1, location 6). Zero depth is defined at the depth of the outlet pipe. Outfall samples will be collected from a location 7 ft downslope from location 6 (Figure 7.2-1, location 7), and 7 ft to the west and east of that location (Figure 7.2-1, locations 8 and 9). Another line of samples will be collected 20 ft downslope from location 7 (Figure 7.2-1, location 10), and 15 ft to the west and east of that location (Figure 7.2-1, locations 11 and 12). One sampling location (Figure 7.2-1, location 13) will be situated 20 ft downslope from location 10. One sampling location (Figure 7.2-1, location 14) will be situated at the mouth of the culvert at the drainage ditch that parallels the road. Samples will be collected from the 0- to 0.5-ft- and 2.0- to 3.0-ft-depth intervals. Zero depth is defined at immediately beneath the fill, except at location 14 where samples will be collected in the appropriate sediment unit(s) and 1 ft deeper.

- During excavation, if the drain tile line is found below the outlet pipe, it will be removed, and samples will be collected at the two ends of the drain tile line from the 0- to 0.5-ft- and 2.0- to 3.0-ft-depth intervals. Zero depth is defined at immediately beneath the excavated line.

Samples will be analyzed at off-site fixed laboratories for TAL metals, cyanide, nitrates, perchlorate, VOCs, SVOCs, PCBs, americium-241, isotopic plutonium, isotopic uranium, strontium-90, tritium, moisture, and pH and by gamma spectroscopy. Dioxins, explosive compounds, and furans will not be analyzed because they are not related to any activities at TA-41.

NMED Comment

21. Section 7.3.3, Scope of Activities for SWMU 41-002(a,b,c), Page 87:

Site investigation for this site has been deferred until future D&D of the sewage treatment plant. Note that no data is available for metals for this consolidated unit. Therefore, metals must be included in the sample analytical suite during future investigations to be conducted at the time of D&D.

LANL Response

21. Comment noted.

NMED Comment

22. Section 7.4.3, Scope of Activities for AOC 41-003, Page 88:

Site investigation for this site has been deferred until the storage tunnel is decommissioned. Note that the previous investigation only focused on radioactive chemicals, full suite of analysis must be included for samples collected during future investigations.

LANL Response

22. Comment noted.

NMED Comment

23. Section 8.4.3, Scope of Activities for AOC 43-001(b2), Page 93:

Samples must be collected along the entire length of drainage to the toe of colluvium at the main channel because contamination may have migrated to the canyon bottom over time. Sample locations must be selected based on geomorphic relationships and sedimentary packages following canyon investigation procedures. Additional samples must be collected from the soil beneath the drain lines, since waste could have leaked from the drain lines in the past and resulted in the contamination of subsurface soil.

LANL Response

23. During the site walk on July 25, 2006, with Neelam Dhawan, Mark Cummings, and Ralph Ford-Schmid (NMED) and Becky Coel-Roback and John Wilcox (LANL), it was decided that additional sampling locations will be added in the active drainage south of the road (under which the drainage passes). Additional sampling locations are proposed for the drainage down the canyon wall to the toe

of the slope. Sampling locations will be selected based on geomorphic relationships and sedimentary packages following canyon investigation procedures. The revised work plan text follows. The revised table (Table 8.4-1) and the revised figure (Figure 8.4-1) are included in Attachments 2 and 3, respectively.

8.4.3 Scope of Activities for AOC 43-001(b2)

The proposed sampling locations at AOC 43-001(b2) are shown in Figure 8.4-1. Table 8.4-1 provides a summary of the proposed sampling locations, depths, the objectives each sample addresses, and the proposed analytical suites. Sampling at AOC 43-001(b2) will consist of the following activities:

- *Outfall Investigation.* Samples will be collected from the 0- to 0.5-ft-, 1.5- to 2.0-ft-, and 4.0- to 5.0-ft depth intervals at the mouth of the 12-in.-diameter corrugated metal pipe (Figure 8.4-1, location 1). Mesa-top outfall samples will be collected in the distinct drainage from a location approximately 15 ft downslope from the mouth of the outfall pipe (Figure 8.4-1, location 2). Three additional mesa-top outfall sampling locations will be situated in the distinct drainage south of the road (Figure 8.4-1, locations 3, 4, and 5). Canyon wall outfall sampling locations will be situated approximately every 50 ft down the distinct drainage until the toe of the slope is sampled (Figure 8.4-1, locations 6 through 11). Sampling locations will be selected by a geomorphologist, and at least two depth intervals will be sampled: one in the appropriate sediment unit(s) and one below the sediment/tuff interface.

A phased approach is proposed for collecting soil beneath the drainline. Sample location 1, at the mouth of the pipe, is the location of the intentional release of effluent and the expected location of the highest concentrations of contaminants. If the sample results from location 1 do not indicate the presence of hazardous constituents or radionuclides, it is unlikely that significant levels of contamination will be present in the subsurface from leaks along the line. If significant contaminant levels are detected at the outfall, additional samples will be collected along the drainline.

NMED Comment

24. Section 8.6.3, Scope of Activities for AOC C-43-001, Page 95:

See Specific Comment # 23.

LANL Response

24. Because no discernable drainage exists at AOC C-43-001 to sample, a phased approach was agreed upon in the July 25, 2006, meeting between Neelam Dhawan (NMED) and Becky Coel-Roback (LANL). At this AOC, sampling will focus on the outfall area. If the results indicate contamination, a phased sampling strategy will be used to plot a path down the canyon side to the toe of the slope or until the downgradient extent of contamination is defined.

NMED Comment

25. Table 1.1-1, Pages 209-213:

For solid waste management units (SWMUs) 00-003, 00-012, and 01-001(m), the correct reference would be NMED's letter (dated August 6, 2003) that granted NFA status to these units, not approval of the investigation reports.

Under 'Site Status' column, the WP indicates that areas of concern (AOCs) 01-006(i), 01-006(k), 01-006(l), 01-006(m), 01-006(p), 01-006(t), 01-007(f), 01-007(g), 01-007(h), 01-007(i), 01-007(m), 01-007(n), 01-007(o), and 01-007(p) are not included in this investigation because NFA was granted by the Environmental Protection Agency (EPA) in 1994. The EPA letter cited as a reference, does not grant NFA to these sites. To the contrary, the letter states that even though some of the units are not identified as SWMUs and do not have to be added to the HSWA Permit, LANL may continue investigation of these units under the Environmental Restoration program. However, these sites were included in the EPA letter (dated January 21, 2005) that granted NFA approval to 542 AOCs based on prior decisions. Revise the Table with correct references.

SWMUs 01-001(h), 01-001(i), 01-001(j), 01-001(k), 01-001(l), and 01-001(n) were not granted NFA by EPA in 1993 as indicated in the table. The letter cited as a reference did not grant NFA for these sites rather stated that "Contingent upon approval from the New Mexico Environment Department (NMED), Los Alamos National Laboratory (LANL) may request a Class III permit modification to remove those SWMUs that are currently in the HSWA permit." However, a permit modification request was submitted by LANL on March 27, 1995 and NFA was granted by NMED on December 23, 1998. Revise the Table with correct references.

The correct reference for NFA for AOC 30-001 is the EPA letter dated January 21, 2005. The United States Department of Energy (DOE) approval cited is not appropriate since DOE is not the appropriate authority to grant NFA for this AOC. Revise the Table with correct reference.

41-004 is not a SWMU as indicated in the table. It is an AOC.

LANL Response

25. All comments have been incorporated into the revised Table 1.1-1, which is included in Attachment 2.

NMED Comment

26. Table 3.1-1, Pages 214-216:

The data provided in Table 3.1-1 for SWMU 00-017 eliminated some samples that were reported in Table 2.3-2 and Appendix D of the RFI Report (July, 26 1999), (e.g. samples collected at locations 00-10125 (18.5-19ft.), 00-10126 (20-20.6 ft.), and 00-10142 (5-9 ft.)). Additionally, the RFI Report had included volatile organic chemicals (VOCs) data for sampling locations 00-10143, 00-10144 and 00-10145. The results are not included in Table 3.1-1, and the WP states that VOC analyses were not requested. Explain the reason for omitting these data and revise the Table and HIR accordingly.

LANL Response

26. Please see LANL's response to specific comment 3 for an explanation of why these samples were eliminated. The VOC data for samples at locations 00-10143, 00-10144, and 00-10145 did not pass the current data validation process that occurred after the 1999 RFI report was submitted. These data are not considered decision-level data and are therefore not included in the all-analyses data table. Table 3.1-1 and the text do not need to be revised.

REFERENCES

EPA (U.S. Environmental Protection Agency), January 21, 2005. "EPA's Prior Decisions on SWMU/AOC Sites at Los Alamos National Laboratory (LANL), the Revised List Now Contains 542 AOCs," U.S. Environmental Protection Agency letter 90-7-3-16854 to J. Bearzi (NMED HWB) from L.F. King (EPA, Region 6), Dallas. Texas. (EPA 2005, 88464)

LANL (Los Alamos National Laboratory), August 1996. "RFI Report for Potential Release Sites in TA-00-031(b) Former Zia Motor Pool Area (Located in Former Operable Unit 1071), Field Unit 1," Los Alamos National Laboratory document LA-UR-96-2746, Los Alamos, New Mexico. (LANL 1996, 54913)

LANL (Los Alamos National Laboratory), September 1996. "Phase II and Voluntary Corrective Action Report for Potential Release Sites at TA-32," Los Alamos National Laboratory document LA-UR-96-3128, Los Alamos, New Mexico. (LANL 1996, 59178)

LANL (Los Alamos National Laboratory), July 1, 1999. "RFI Report for Potential Release Site 0-017 (Former Line 167, Line 170, Line 171)," Los Alamos National Laboratory document LA-UR-99-3354, Los Alamos, New Mexico. (LANL 1999, 64029)

LANL (Los Alamos National Laboratory), April 2006. "Historical Investigation Report for Upper Los Alamos Canyon Aggregate Area," Los Alamos National Laboratory document LA-UR-06-2465, Los Alamos, New Mexico. (LANL 2006, 91915)

LANL (Los Alamos National Laboratory), April 2006. "Investigation Work Plan for Upper Los Alamos Canyon Aggregate Area," Los Alamos National Laboratory document LA-UR-06-2464, Los Alamos, New Mexico. (LANL 2006, 91916)

NMED (New Mexico Environment Department), August 6, 2003. "Approval of Class III Permit Modification to Remove Seven (7) Solid Waste Management Units from the Department of Energy/Los Alamos National Laboratory RCRA Permit NM0890010515," New Mexico Environment Department letter from C. Lundstrom (NMED HWB) to R. Erickson (DOE LAAO) and G. Pete Nanos (LANL), Santa Fe, New Mexico. (NMED 2003, 78138)

Attachment 1

Status of Industrial Waste Line in Upper Los Alamos Canyon Aggregate and Pueblo Canyon Aggregate

Line Location	Lines Removed	Lines Left in Place
TA-01	All lines removed in 1964	None (DOE 1979, 08897, p. 7)
From TA-01 to TA-45 and from TA-43 to TA-45	All lines removed. The three sections under Central Ave. (Line 173C), Rose St. (Line 173B), and Canyon Rd. (Line 173A) removed in 1985	None (DOE 1979, 08897, Fig. 4, p. 5; Elder et al. 1986, 06666, Table VII and Figure 11, p. 37–38)
TA-43 and Los Alamos Canyon	1) Most line sections in TA-43 were removed by 1979 (DOE 1979, 08897, Figure 18, p. 23) 2) Line 167 was removed by 1986 except for 9 concrete anchors (Elder et al. 1986, 06666, p. 37)	1. Line 170 (a 200-ft section) from HRL to ULR-61 left in place (Elder et al. 1986, 06666, p. 37). (Note: a 26-ft section at the beginning of Line 170 was removed in 1991 [LANL 1999, 64029, p. 5]). 2. Line 171 (a 365-ft section) from ULR-61 to ULR-60 left in place (Elder et al. 1986, 06666, p. 37) 3. Line 172 removed, except for an uncontaminated 12-in.-diameter steel casing (Elder et al. 1986, 06666, p. 37) 4. On north wall of Los Alamos Canyon, four 3-ft sections of pipe left encased in the concrete anchors (Cox 1984, 30811) 5. On south wall of Los Alamos Canyon, five sections of pipe left encased in the concrete anchors: three 3-ft sections, one 2.4-ft section, and one 5-ft section (Montoya 1985, 07295)
TA-03	Line 1: Partially removed	1. A 150-ft section left under the intersection of Diamond and W. Jemez Rd. (Elder et al. 1986, 06666, Table IX, p. 42) 2. A 140-ft section left north from MH-SM-708 (Elder et al. 1986, 06666, Table XI, p. 47)
	Line 23: Partially removed	A 160-ft section left under the intersection of Diamond and W. Jemez Rd. (Elder et al. 1986, 06666, Tables IX, p. 42)

Sources:

DOE (U.S. Department of Energy), April 1979. "Formerly Utilized MED AEC Sites Remedial Action Program, Removal of a Contaminated Industrial Waste Line, Los Alamos, New Mexico," Los Alamos Scientific Laboratory document prepared for the U.S. Department of Energy, Division of Environmental Control Technology, Los Alamos, New Mexico. (DOE 1979, 08897)

Elder, J.C., E.J. Cox, D.P. Hohner, and A.M. Valentine, September 1986. "Radioactive Liquid Waste Lines Removal Project at Los Alamos (1981–1986)," Los Alamos National Laboratory report LA-10821-MS, Los Alamos National Laboratory, Los Alamos, New Mexico. (Elder et al. 1986, 06666)

LANL (Los Alamos National Laboratory), July 1, 1999. "RFI Report for Potential Release Site 0-017 (Former Line 167, Line 170, Line 171)," Los Alamos National Laboratory document LA-UR-99-3354, Los Alamos, New Mexico. (LANL 1999, 64029)

Cox, J., 1984. "Line 167: Concrete Anchors Left in Place on North Side of Los Alamos Canyon," Los Alamos National Laboratory memorandum (HSE-1-84) to R. Garde from J. Cox, Los Alamos, New Mexico. (Cox 1984, 30811)

Montoya, G.M., November 25, 1985. "Line 167: Concrete Anchors Left in Place on South Side of Los Alamos Canyon," Los Alamos National Laboratory memorandum to A. Valentine (Radiation Protection Group) from G. Montoya (HSE-1), Los Alamos, New Mexico. (Montoya 1985, 07295)

Attachment 2

Revised Tables

Table 3.1-1
Summary of Analytical Suites for Samples Previously Collected in TA-00

AOC/ SWMU	Sample ID	Location ID	Depth (ft)	Media	Collection Date	Cyanide (Total)	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	Metals	PCBs	Pesticides	SVOCs	VOCs
00-017	RE00-98-0051	00-10125	18.5–19	Fill	9/24/1998	✓[a]	✓	✓	✓	✓	✓	✓	✓	✓	✓
00-017	RE00-98-0052	00-10125	19–19.5	Tuff	9/24/1998	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
00-017	RE00-98-0053	00-10126	20–20.6	Fill	9/24/1998	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
00-017	RE00-98-0054	00-10126	22.5–25	Tuff	9/24/1998	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
00-017	RE00-98-0056	00-10127	19–21.5	Tuff	9/23/1998	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
00-017	RE00-98-0057	00-10127	22.5–25	Tuff	9/23/1998	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
00-017	RE00-98-0059	00-10128	19–21.5	Fill	9/24/1998	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
00-017	RE00-98-0060	00-10128	22.5–25	Tuff	9/24/1998	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
00-017	RE00-98-0062	00-10129	19.5–22	Fill	9/24/1998	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
00-017	RE00-98-0063	00-10129	22.5–25	Tuff	9/24/1998	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
00-017	RE00-98-0065	00-10130	19.5–22	Fill	9/24/1998	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
00-017	RE00-98-0066	00-10130	24–26.5	Tuff	9/24/1998	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
00-017	RE00-98-0068	00-10131	20.5–23	Fill	9/24/1998	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
00-017	RE00-98-0069	00-10131	25–27.5	Tuff	9/24/1998	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
00-017	RE00-98-0072	00-10132	16–18.5	Fill	10/24/1998	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
00-017	RE00-98-0073	00-10132	20–22.5	Tuff	10/24/1998	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
00-017	RE00-98-0074	00-10133	15–17.5	Soil	10/24/1998	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
00-017	RE00-98-0076	00-10133	18.5–21	Tuff	10/24/1998	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
00-017	RE00-98-0078	00-10134	15–17.5	Soil	10/24/1998	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
00-017	RE00-98-0079	00-10134	20–22.5	Tuff	10/24/1998	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
00-017	RE00-98-0083	00-10135	14–15.5	Soil	10/24/1998	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
00-017	RE00-98-0084	00-10135	20–22.5	Tuff	10/24/1998	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Table 3.1-1 (continued)

AOC/ SWMU	Sample ID	Location ID	Depth (ft)	Media	Collection Date	Cyanide (Total)	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	Metals	PCBs	Pesticides	SVOCs	VOCs
00-017	RE00-98-0085	00-10136	12.5–14.5	Tuff	10/24/1998	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
00-017	RE00-98-0086	00-10136	14.5–16	Tuff	10/24/1998	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
00-017	RE00-98-0087	00-10137	12.5–15	Soil	10/25/1998	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
00-017	RE00-98-0088	00-10137	16–18.5	Tuff	10/25/1998	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
00-017	RE00-98-0089	00-10138	12.5–15	Soil	10/25/1998	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
00-017	RE00-98-0090	00-10138	15–17.5	Tuff	10/25/1998	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
00-017	RE00-98-0091	00-10139	13–15	Soil	10/25/1998	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
00-017	RE00-98-0092	00-10139	15–17.5	Tuff	10/25/1998	✓	✓	◊[b]	✓	✓	✓	✓	✓	✓	✓
00-017	RE00-98-0093	00-10140	12.5–15	Soil	10/25/1998	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
00-017	RE00-98-0094	00-10140	16–18.5	Tuff	10/25/1998	✓	◊	✓	✓	✓	✓	✓	✓	✓	✓
00-017	RE00-98-0095	00-10141	7.5–9	Soil	11/3/1998	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
00-017	RE00-98-0099	00-10143	0.1–0.7	Sed	11/11/1998	✓	✓	✓	✓	✓	✓	✓	✓	✓	◊
00-017	RE00-98-0101	00-10144	1–2	Sed	11/11/1998	✓	✓	✓	✓	✓	✓	✓	✓	✓	◊
00-017	RE00-98-0103	00-10145	0.3–1	Sed	11/11/1998	✓	✓	✓	✓	✓	✓	✓	✓	✓	◊
00-017	RE00-98-0105	00-10146	0.2–1	Sed	11/11/1998	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
00-017	RE00-99-0003	00-10179	0.1–0.5	Soil	1/20/1999	◊	◊	◊	◊	◊	L[c]	◊	◊	◊	◊
00-017	RE00-99-0004	00-10180	0.1–0.4	Soil	1/20/1999	◊	◊	◊	◊	◊	L	◊	◊	◊	◊
00-017	RE00-99-0005	00-10181	0.1–0.8	Soil	1/22/1999	◊	◊	◊	◊	◊	L	◊	◊	◊	◊
00-017	RE00-99-0006	00-10182	0.2–0.8	Soil	1/22/1999	◊	◊	◊	◊	◊	L	◊	◊	◊	◊
00-017	RE00-99-0007	00-10183	0.1–0.3	Soil	1/22/1999	◊	◊	◊	◊	◊	L	◊	◊	◊	◊
00-017	RE00-99-0008	00-10184	0.1–0.6	Soil	1/22/1999	◊	◊	◊	◊	◊	L	◊	◊	◊	◊
00-031(b)	AAB0242	00-01588	10–15	Tuff	5/16/1994	◊	◊	◊	◊	◊	L	◊	◊	◊	◊
00-031(b)	AAB0243	00-01588	40–45	Tuff	5/16/1994	◊	◊	◊	◊	◊	L	◊	◊	◊	◊

Table 3.1-1 (continued)

AOC/ SWMU	Sample ID	Location ID	Depth (ft)	Media	Collection Date	Cyanide (Total)	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	Metals	PCBs	Pesticides	SVOCs	VOCs
00-031(b)	AAB0244	00-01588	65–70	Tuff	5/16/1994	◊	◊	◊	◊	◊	L	◊	◊	◊	◊
00-031(b)	AAB0246	00-01589	5–10	Tuff	5/17/1994	◊	◊	◊	◊	◊	L	◊	◊	◊	◊
00-031(b)	AAB0247	00-01589	10–15	Tuff	5/17/1994	◊	◊	◊	◊	◊	L	◊	◊	◊	◊
00-031(b)	AAB0248	00-01589	55–60	Tuff	5/17/1994	◊	◊	◊	◊	◊	L	◊	◊	◊	◊
00-031(b)	AAB0249	00-01589	75–80	Tuff	5/18/1994	◊	◊	◊	◊	◊	L	◊	◊	◊	◊
00-031(b)	AAB0171	00-01602	0.33–1	Soil	5/7/1994	◊	◊	◊	◊	◊	L	◊	◊	◊	◊
00-031(b)	AAB6639	00-01613	2.2–2.2	Soil	6/30/1994	◊	◊	◊	◊	◊	✓	◊	◊	✓	◊
00-031(b)	AAB6638	00-01614	1.8–1.8	Soil	6/30/1994	◊	◊	◊	◊	◊	✓	◊	◊	✓	◊

[a] ✓= Analysis was requested for the sample.

[b] ◊ = Analysis was not requested for the sample.

[c] L = Only lead was analyzed.

Table 4.14-1
Summary of Proposed Sampling at SWMU 01-003(a)

Objective Addressed	Location Number	Location	Sample Depths (ft)	TAL Metals	Cyanide	Nitrates	Perchlorate	VOCs	SVOCs	PCBs	Gamma Spectroscopy	Americium-241	Isotopic Plutonium	Isotopic Uranium	Strontium-90	Tritium	Moisture	pH
Area of Landfill																		
Determine nature and extent of potential contamination of the landfill	1	30 ft southwest from the southwest corner of the current building	0–0.5 2–3	X X	X X	X X	X X	—[a] X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine nature and extent of potential contamination of the landfill	2	50 ft southeast of location 1, 30 ft downslope from the current building	0–0.5 5–6 every 5 ft fill/tuff	X X X X	X X X X	X X X X	X X X X	— X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X
Determine nature and extent of potential contamination of the landfill	3	50 ft downslope of location 1	0–0.5 2–3	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine nature and extent of potential contamination of the landfill	4	50 ft downslope of location 2	0–0.5 5–6 every 5 ft fill/tuff	X X X X	X X X X	X X X X	X X X X	— X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X
Drainage																		
Determine nature and extent of potential contamination of the landfill	5	50 ft southeast downslope of location 3, start of the drainage	Two depths[b]	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine extent of potential contamination	6	50 ft downslope of location 5, in the main drainage	Two depths	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Confirm existence and vertical extent of radionuclides contamination	7	1 ft downslope from previous sampling location 01-02114	Two depths	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine extent of potential contamination	8	50 ft downslope of location 6, in the main drainage	Two depths	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X

Table 4.14-1 (continued)

Objective Addressed	Location Number	Location	Sample Depths (ft)	TAL Metals	Cyanide	Nitrates	Perchlorate	VOCs	SVOCs	PCBs	Gamma Spectroscopy	Americium-241	Isotopic Plutonium	Isotopic Uranium	Strontium-90	Tritium	Moisture	pH
Confirm existence and vertical extent of plutonium contamination	9	1 ft downslope from previous sampling location 01-02133	Two depths	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine extent of potential contamination	10	50 ft downslope of location 8, in the main drainage	Two depths	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine extent of potential contamination	11	50 ft downslope of location 10, in the main drainage	Two depths	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine extent of potential contamination	12	50 ft downslope of location 11, in the main drainage	Two depths	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine extent of potential contamination	13	50 ft downslope of location 12, in the main drainage	Two depths	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine extent of potential contamination	14	50 ft downslope of location 13, in the main drainage	Two depths	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine extent of potential contamination	15	1 ft downslope from previous sampling location 01-02171 (1623465.7, 1775068.2)	Two depths	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine extent of potential contamination	16	1 ft downslope from previous sampling location 01-02172 (1623457.7, 1775032.1)	Two depths	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine extent of potential contamination	17	50 ft downslope of location 16, in the main drainage	Two depths	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine extent of potential contamination	18	50 ft downslope of location 17, in the main drainage	Two depths	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X

Note: Zero depth is defined as below ground surface.

[a] — = This sample analysis will not be requested.

[b] One depth interval is in the sediment unit(s), and the other is below the sediment/tuff interface.

Table 4.28-1
Summary of Proposed Sampling at SWMUs 01-007(a), 01-006(b), and 01-006(n)

Objective Addressed	Location Number	Location	Sample Depths (ft)	TAL Metals	Cyanide	Nitrates	Perchlorate	VOCs	SVOCs	PCBs	Gamma Spectroscopy	Americium-241	Isotopic Plutonium	Isotopic Uranium	Strontium-90	Tritium	Moisture	pH
Area of SWMU 01-007(a)																		
Determine existence and vertical extent of plutonium contamination	1	Proximity of 01-04024	5–6 8–9 11–12 14–15	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X
Determine existence and vertical extent of plutonium contamination	2	Proximity of 01-04025	5–6 8–9 11–12 14–15	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X
Drain Line and Outfall of SWMU 01-006(b)																		
Determine nature and vertical extent of potential contamination beneath the excavated pipeline	3	Beneath the excavated pipeline, at the origin of the pipeline	0–1[a] 2–3	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine nature and vertical extent of potential contamination at the mouth of the outfall	4	At the outfall	0–0.5 1.5–2 4–5	X X X	X X X	X X X	X X X	— X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X
Determine extent of potential contamination	5	7 ft downslope from location 4	Two depths[b]	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine extent of potential contamination	6	7 ft west of location 5	Two depths	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine extent of potential contamination	7	7 ft east of location 5	Two depths	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X

Table 4.28-1 (continued)

Objective Addressed	Location Number	Location	Sample Depths (ft)	TAL Metals	Cyanide	Nitrates	Perchlorate	VOCs	SVOCs	PCBs	Gamma Spectroscopy	Americium-241	Isotopic Plutonium	Isotopic Uranium	Strontium-90	Tritium	Moisture	pH
Outfall of SWMU 01-006(n)																		
Determine nature and vertical extent of potential contamination at the mouth of the outfall	8	At the outfall	0–0.5 1.5–2 4–5	X X X	X X X	X X X	X X X	— X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X
Determine extent of potential contamination	9	7 ft downslope from location 8	Two depths	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine extent of potential contamination	10	7 ft west of location 9	Two depths	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine extent of potential contamination	11	7 ft east of location 9	Two depths	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Drainage																		
Determine extent of potential contamination	12	1 ft downslope from previous sampling location 01-03106	Two depths	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine extent of potential contamination and inorganic contaminants	13	1 ft downslope from previous sampling location 01-03069	Two depths	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine extent of potential contamination	14	70 ft downslope from location 13, in the main drainage	Two depths	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine extent of potential contamination	15	70 ft downslope from location 14, in the main drainage	Two depths	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine extent of potential contamination	16	70 ft downslope from location 15, in the main drainage	Two depths	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine extent of potential contamination	17	70 ft downslope from location 16, in the main drainage	Two depths	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine extent of potential contamination	18	70 ft downslope from location 17, in the main drainage	Two depths	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X

Note: Unless specified, zero depth is defined as below ground surface.

[a] Zero depth is defined as immediately beneath the excavated pipe.

[b] One depth interval is in the sediment unit(s), and the other is below the sediment/tuff interface.

Table 4.31-1
Summary of Proposed Sampling at SWMU 01-007(d)

Objective Addressed	Location Number	Location	Sample Depths (ft)	TAL Metals	Cyanide	Nitrates	Perchlorate	VOCs	SVOCs	PCBs	Gamma Spectroscopy	Americium-241	Isotopic Plutonium	Isotopic Uranium	Strontium-90	Tritium	Moisture	pH
Borehole Samples																		
Determine nature and vertical extent of potential contamination	1	At the community area southeast of the condominiums	0–1* 2–3	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine nature and vertical extent of potential contamination	2	In Short Dr., in front of the condominium	0–1* 2–3	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine nature and vertical extent of potential contamination	3	In Short Dr., in front of the condominium	0–1* 2–3	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X

*Zero depth is defined as undisturbed tuff.

Table 4.32-1
Summary of Proposed Sampling at SWMU 01-007(e)

Objective Addressed	Location Number	Location	Sample Depths (ft)	TAL Metals	Cyanide	Nitrates	Perchlorate	VOCs	SVOCs	PCBs	Gamma Spectroscopy	Americium-241	Isotopic Plutonium	Isotopic Uranium	Strontium-90	Tritium	Moisture	pH
Determine nature and vertical extent of potential contamination	1	In landscaped area west of the intersection of Oppenheimer Dr. and Loma Vista Dr.	0–1* 2–3	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine nature and vertical extent of potential contamination	2	In paved area west of the north end of the building that is west of the intersection of Oppenheimer Dr. and Loma Vista Dr.	0–1* 2–3	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X

*Zero depth is defined as undisturbed tuff.

Table 4.33-1
Summary of Proposed Sampling at SWMU 01-007(j)

Objective Addressed	Location Number	Location	Sample Depths (ft)	TAL Metals	Cyanide	Nitrates	Perchlorate	VOCs	SVOCs	PCBs	Gamma Spectroscopy	Americium-241	Isotopic Plutonium	Isotopic Uranium	Strontium-90	Tritium	Moisture	pH
Determine nature and vertical extent of potential contamination	1	In parking lot area west of the intersection of Oppenheimer Dr. and Short Dr.	0–1* 2–3	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X

*Zero depth is defined at the soil/tuff interface.

Table 6.2-1
Summary of Proposed Sampling at SWMU 32-001

Objective Addressed	Location Number	Location	Sample Depths (ft)	TAL Metals	Cyanide	Nitrates	Perchlorate	VOCs	SVOCs	PCBs	Dioxins	Furans	Gamma Spectroscopy	Americium-241	Isotopic Plutonium	Isotopic Uranium	Strontium-90	Tritium	Moisture	pH
Incinerator																				
Determine nature and extent of potential contamination	1	6 ft north of incinerator location	0–1* 2–3	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine nature and extent of potential contamination	2	6 ft east of incinerator location	0–1 2–3	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine nature and extent of potential contamination	3	6 ft south of incinerator location	0–1 2–3	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine nature and extent of potential contamination	4	6 ft west of incinerator location	0–1 2–3	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine nature and extent of potential contamination	5	Center of incinerator location	0–1 2–3	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X

*Zero depth is 0.5 ft beneath the pavement

Table 6.3-1
Summary of Proposed Sampling at SWMU 32-002(a)

Objective Addressed	Location Number	Location	Sample Depths (ft)	TAL Metals	Cyanide	Nitrates	Perchlorate	VOCs	SVOCs	PCBs	Dioxins	Furans	Gamma Spectroscopy	Americium-241	Isotopic Plutonium	Isotopic Uranium	Strontium-90	Tritium	Moisture	pH
Drain Line																				
Determine nature and extent of potential contamination	1	Immediately adjacent to location 32-06373	0–1[a] 2–3	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine nature and extent of potential contamination	2	Immediately adjacent to location 32-06369	0–1[a] 2–3	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine nature and extent of potential contamination	3	Immediately adjacent to location 32-06371	0–1[a] 2–3	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Septic Tank																				
Determine nature and extent of potential contamination	4	Center of the septic tank excavation	1.5–2.5 3.5–4.5	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine nature and extent of potential contamination	5	Immediately north of the excavation perimeter	0–0.5 2–3	X X	X X	X X	X X	—[b] X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine nature and extent of potential contamination	6	Immediately east of the excavation perimeter	0–0.5 2–3	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine nature and extent of potential contamination	7	Immediately south of the excavation perimeter	0–0.5 2–3	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine nature and extent of potential contamination	8	Immediately west of the excavation perimeter	0–0.5 2–3	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X

Note: Zero depth is defined as at ground surface.

[a] Zero depth is defined as immediately beneath the excavated pipe.

[b] — = This sample analysis will not be requested.

Table 6.4-1
Summary of Proposed Sampling at SWMU 32-002(b)

Objective Addressed	Location Number	Location	Sample Depths (ft)	TAL Metals	Cyanide	Nitrates	Perchlorate	VOCs	SVOCs	PCBs	Dioxins	Furans	Gamma Spectroscopy	Americium-241	Isotopic Plutonium	Isotopic Uranium	Strontium-90	Tritium	Moisture	pH
Drain Line																				
Determine nature and extent of potential contamination	1	Immediately adjacent to location 32-06365	0–1* 2–3	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine nature and extent of potential contamination	2	Immediately adjacent to location 32-06366	0–1* 2–3	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine nature and extent of potential contamination	3	Immediately adjacent to location 32-06377	0–1* 2–3	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine nature and extent of potential contamination	4	50 ft downgradient of location 3 in the drain line path	0–1* 2–3	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine nature and extent of potential contamination	5	Outfall end of the drain line	0–1* 2–3	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Septic Tank																				
Determine nature and extent of potential contamination	6	Center of the septic tank excavation	Soil/fill interface 2 ft deeper	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine nature and extent of potential contamination	7	Immediately north of the excavation perimeter	Soil/tuff interface 1 ft deeper	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine nature and extent of potential contamination	8	Immediately east of the excavation perimeter	Soil/tuff interface 1 ft deeper	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X

Table 6.4-1 (continued)

Objective Addressed	Location Number	Location	Sample Depths (ft)	TAL Metals	Cyanide	Nitrates	Perchlorate	VOCs	SVOCs	PCBs	Dioxins	Furans	Gamma Spectroscopy	Americium-241	Isotopic Plutonium	Isotopic Uranium	Strontium-90	Tritium	Moisture	pH
Determine nature and extent of potential contamination	9	Immediately south of the excavation perimeter	Soil/tuff interface 1 ft deeper	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine nature and extent of potential contamination	10	Immediately west of the excavation perimeter	Soil/tuff interface 1 ft deeper	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Outfall																				
Determine nature and extent of potential contamination	11	Toe of the slope	Sediment Sediment/tuff interface	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X

*Zero depth is defined as immediately beneath the excavated pipe.

Table 6.5-1
Summary of Proposed Sampling at AOC 32-003

Objective Addressed	Location Number	Location	Sample Depths (ft)	PCBs	pH	VOCs	SVOCs	Metals
Determine extent of PCB contamination	1	Approximately 5 ft north of the excavation	0–0.5 2–2.5	X X	X X	X X	X X	X X
Determine extent of PCB contamination	2	Approximately 5 ft east of the excavation	0–0.5 2–2.5	X X	X X	X X	X X	X X
Determine extent of PCB contamination	3	Approximately 5 ft south of the excavation	0–0.5 2–2.5	X X	X X	X X	X X	X X
Determine extent of PCB contamination	4	Approximately 5 ft west of the excavation	0–0.5 2–2.5	X X	X X	X X	X X	X X
Determine extent of PCB contamination	5	5 ft up slope of previous screening location 32-06458	0–0.5 2–2.5	X X	X X	X X	X X	X X
Determine extent of PCB contamination	6	Adjacent to previous screening location 32-06458	Soil/fill interface 1 ft deeper	X X	X X	X X	X X	X X
Determine extent of PCB contamination	7	Adjacent to previous screening location 32-06461	Soil/fill interface 1 ft deeper	X X	X X	X X	X X	X X
Determine extent of PCB contamination	8	Adjacent to previous screening location 32-06477	Soil/fill interface 1 ft deeper	X X	X X	X X	X X	X X
Determine extent of PCB contamination	9	Adjacent to previous screening location 32-06466	Soil/fill interface 1 ft deeper	X X	X X	X X	X X	X X
Determine extent of PCB contamination	10	Adjacent to previous screening location 32-06469	Soil/fill interface 1 ft deeper	X X	X X	X X	X X	X X
Determine extent of PCB contamination	11	Adjacent to previous screening location 32-06486	Soil/fill interface 1 ft deeper	X X	X X	X X	X X	X X
Determine extent of PCB contamination	12	Equidistant between previous screening locations 32-06488, 32-06490, and 32-06491	Soil/fill interface 1 ft deeper	X X	X X	X X	X X	X X

Note: Zero depth is defined as below ground surface.

Table 7.2-1
Summary of Proposed Sampling at SWMU 41-001

Objective Addressed	Location Number	Location	Sample Depths (ft)	TAL Metals	Cyanide	Nitrates	Perchlorate	VOCs	SVOCs	PCBs	Gamma Spectroscopy	Americium-241	Isotopic Plutonium	Isotopic Uranium	Strontium-90	Tritium	Moisture	pH
Sewer Line																		
Determine nature and vertical extent of potential contamination beneath excavated pipeline	1	Beneath the excavated pipeline, at the turn of the pipeline	0–1[a] 2–3	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine nature and vertical extent of potential contamination beneath excavated pipeline	2	Beneath the excavated pipeline, 40 ft from location 1	0–1[a] 2–3	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Septic Tank																		
Determine nature and vertical extent of potential contamination beneath the inlet of septic tank	3	Beneath the inlet of septic tank	0–1[a] 2–3	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine nature and vertical extent of potential contamination beneath septic tank	4	Center of the floor of the excavated septic tank	0–1[a] 4–5	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine nature and vertical extent of potential contamination beneath the outlet of septic tank	5	Beneath the outlet of septic tank	0–1[a] 2–3	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Outfall																		
Determine nature and vertical extent of potential contamination at the mouth of the outfall	6	At the mouth of the outfall pipe	0–0.5[a] 1.5–2 4-5	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X
Determine nature and extent of potential contamination	7	7 ft downslope from location 6	0–0.5[b] 2–3	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine nature and extent of potential contamination	8	7 ft west of location 7	0–0.5[b] 2–3	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X

Table 7.2-1 (continued)

Objective Addressed	Location Number	Location	Sample Depths (ft)	TAL Metals	Cyanide	Nitrates	Perchlorate	VOCs	SVOCs	PCBs	Gamma Spectroscopy	Americium-241	Isotopic Plutonium	Isotopic Uranium	Strontium-90	Tritium	Moisture	pH
Determine nature and extent of potential contamination	9	7 ft east of location 7	0–0.5[b] 2–3	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine nature and extent of potential contamination	10	20 ft downslope from location 7	0–0.5[b] 2–3	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine nature and extent of potential contamination	11	15 ft west of location 10	0–0.5[b] 2-3	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine nature and extent of potential contamination	12	15 ft east of location 10	0–0.5[b] 2–3	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine nature and extent of potential contamination	13	20 ft downslope from location 10	0–0.5[b] 2–3	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Determine nature and extent of potential contamination	14	At the mouth of the culvert at the drainage ditch that parallels the road	Sediment 1 ft deeper	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X

[a] Zero depth is defined as immediately beneath the excavated tank or pipe.

[b] Zero depth is defined as immediately beneath the fill.

Table 8.4-1
Summary of Proposed Sampling at AOC 43-001(b2)

Objective Addressed	Location Number	Location	Sample Depths (ft)	TAL Metals	Cyanide	Nitrates	Perchlorate	VOCs	SVOCs	PCBs	Dioxins	Furans	Gamma Spectroscopy	Americium-241	Isotopic Plutonium	Isotopic Uranium	Strontium-90	Tritium	Moisture	pH
Outfall																				
Nature and vertical extent of potential contamination at the mouth of the outfall	1	Mouth of the outfall pipe	0–0.5 [a] 1.5–2 4–5	X X X	X X X	X X X	X X X	—[b] X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X
Nature and extent of potential contamination	2	15 ft downslope of the outfall pipe	Two depths[c]	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Nature and extent of potential contamination	3	In the drainage south of the road	Two depths	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Nature and extent of potential contamination	4	In the drainage south of the road	Two depths	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Nature and extent of potential contamination	5	In the drainage south of the road	Two depths	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Nature and extent of potential contamination	6	In drainage down canyon wall	Two depths	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Nature and extent of potential contamination	7	Approx. 50 ft downslope of location 6	Two depths	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Nature and extent of potential contamination	8	Approx. 50 ft downslope of location 7	Two depths	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Nature and extent of potential contamination	9	Approx. 50 ft downslope of location 8	Two depths	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Nature and extent of potential contamination	10	Approx. 50 ft downslope of location 9	Two depths	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
Nature and extent of potential contamination	11	In the drainage at the toe of the slope	Two depths	X X	X X	X X	X X	— X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X

[a] Zero depth is defined as at ground surface.

[b] — = This sample analysis will not be requested.

[c] One depth interval is in the sediment unit(s), and the other is below the sediment-tuff interface.

Table 1.1-1
Upper Los Alamos Canyon Aggregate Area Sites and Their Regulatory Status

Consolidated Unit	SWMU/AOC Number	Site Description	Site in HIR?	Site in Work Plan?	Site Status
TA-00					
00-003-99 Western Steam Plant	SWMU 00-003	Container storage area	Yes	No	NFA granted (NMED 2003, 78138)
	SWMU 00-012	Former underground blow-off tank	Yes	No	NFA granted (NMED 2003, 78138)
	SWMU 00-017	Waste lines	Yes	Yes	Investigation for former Line 167; No sampling proposed for Line 170 and Line 171
	AOC 00-030(i)	Septic system	Yes	No	NFA granted (NMED 2002, 73096)
	AOC 00-031(a)	Soil contamination beneath former service station	Yes	Yes	No sampling proposed
	AOC 00-031(b)	Soil contamination beneath former motor pool (two USTs)	Yes	Yes	No sampling proposed
	AOC 00-032	Soil contamination beneath former motor pool (UST for used motor oil)	Yes	No	NFA granted (EPA 2005, 88464)
	AOC 00-034(b)	Landfill, western area	Yes	Yes	No sampling proposed
	AOC 00-035(a)	Surface disposal	Yes	No	NFA granted (EPA 2005, 88464)
	AOC C-00-042	Tank (formerly part of SWMU 00-032)	Yes	Yes	No sampling proposed
TA-01					
01-001(a)-99 Miscellaneous TA-01	SWMU 01-001(a)	Septic tank 134	Yes	Yes	Investigation
	SWMU 01-001(b)	Septic tank 135	Yes	Yes	Investigation
	SWMU 01-001(c)	Septic tank 137	Yes	Yes	Investigation
	SWMU 01-001(d)	Septic tank 138	Yes	Yes	Investigation
	SWMU 01-001(e)	Septic tank 139	Yes	Yes	Investigation
	SWMU 01-001(f)	Septic tank 140	Yes	Yes	Investigation
	SWMU 01-001(g)	Septic tank 141	Yes	Yes	Investigation
	SWMU 01-001(o)	Sanitary waste line	Yes	Yes	Investigation
	SWMU 01-001(s)	Western sanitary waste line, main line	Yes	Yes	Investigation
	SWMU 01-001(t)	Eastern sanitary waste line	Yes	Yes	Investigation
	SWMU 01-001(u)	Western sanitary waste line, branch line	Yes	Yes	Investigation
	SWMU 01-002	Industrial waste line	Yes	Yes	Investigation
	SWMU 01-003(a)	Bailey Bridge landfill	Yes	Yes	Investigation
	SWMU 01-003(b)	Surface disposal area	Yes	Yes	Investigation

Table 1.1-1 (continued)

Consolidated Unit	SWMU/AOC Number	Site Description	Site in HIR?	Site in Work Plan?	Site Status
01-001(a)-99 Miscellaneous TA-01 (continued)	SWMU 01-003(e)	Surface disposal site southeast of Los Alamos Inn	Yes	Yes	Investigation
	AOC 01-004(a)	Gas-fired incinerator	Yes	No	NFA granted (EPA 2005, 88464)
	AOC 01-004(b)	Gas-fired incinerator	Yes	No	NFA granted (EPA 2005, 88464)
	AOC 01-005	Bench-scale incinerator	Yes	No	NFA granted (EPA 2005, 88464)
	SWMU 01-006(a)	Cooling tower drainline and outfall	Yes	Yes	Investigation
	SWMU 01-006(b)	Drainline and outfall	Yes	Yes	Investigation
	SWMU 01-006(c)	Drainlines and outfalls	Yes	Yes	Investigation
	SWMU 01-006(d)	Drainline and outfall	Yes	Yes	Investigation
	AOC 01-006(e)	Drainlines and outfalls to Ashley Pond	Yes	Yes	Investigation
	AOC 01-006(g)	Storm water drainage system	Yes	Yes	Investigation
	SWMU 01-006(h)	Storm water drainage system	Yes	Yes	Investigation
	SWMU 01-006(n)	Storm water drainage system	Yes	Yes	Investigation
	SWMU 01-006(o)	Storm water drainage system	Yes	Yes	Investigation
	AOC 01-006(p)	Storm drain and outfall	Yes	No	NFA granted (EPA 2005, 88464)
	SWMU 01-007(a)	Suspected subsurface soil radiological contamination	Yes	Yes	Investigation
	SWMU 01-007(b)	Suspected subsurface soil radiological contamination	Yes	Yes	Investigation
	AOC 01-007(h)	Suspected soil contamination	Yes	No	NFA granted (EPA 2005, 88464)
	AOC 01-007(i)	Suspected soil contamination	Yes	No	NFA granted (EPA 2005, 88464)
	SWMU 01-007(j)	12 areas of suspected subsurface soil radiological contamination	Yes	Yes	Investigation
	SWMU 01-007(l)	Suspected subsurface soil contamination	Yes	Yes	No sampling proposed
	AOC 01-007(m)	Suspected soil contamination	Yes	No	NFA granted (EPA 2005, 88464)
	AOC 01-007(o)	Suspected soil contamination	Yes	No	NFA granted (EPA 2005, 88464)
	AOC 01-007(h)	Suspected soil contamination	Yes	No	NFA granted (EPA 2005, 88464)
	AOC 01-007(i)	Suspected soil contamination	Yes	No	NFA granted (EPA 2005, 88464)

Table 1.1-1 (continued)

Consolidated Unit	SWMU/AOC Number	Site Description	Site in HIR?	Site in Work Plan?	Site Status
01-001(a)-99 Miscellaneous TA-01 (continued)	SWMU 01-007(j)	12 Areas of suspected subsurface soil radiological contamination	Yes	Yes	Investigation
	SWMU 01-007(l)	Suspected subsurface soil contamination	Yes	Yes	No sampling proposed
	AOC 01-007(m)	Suspected soil contamination	Yes	No	NFA granted (EPA 2005, 88464)
	AOC 01-007(o)	Suspected soil contamination	Yes	No	NFA granted (EPA 2005, 88464)
	SWMU 01-001(h)	Septic tank 142	Yes	No	NFA granted (NMED 1998, 63042)
	SWMU 01-001(i)	Septic tank 143	Yes	No	NFA granted (NMED 1998, 63042)
	SWMU 01-001(j)	Septic tank 149	Yes	No	NFA granted (NMED 1998, 63042)
	SWMU 01-001(k)	Septic tank 268	Yes	No	NFA granted (NMED 1998, 63042)
	SWMU 01-001(l)	Septic tank 269	Yes	No	NFA granted (NMED 1998, 63042)
	SWMU 01-001(m)	Septic tank 275	Yes	No	NFA granted (NMED 2003, 78138)
	SWMU 01-001(n)	Septic tank 276	Yes	No	NFA granted (NMED 1998, 63042)
	AOC 01-001(p)	Septic system	Yes	No	NFA granted (EPA 2005, 88464)
	AOC 01-001(q)	Septic system	Yes	No	NFA granted (EPA 2005, 88464)
	AOC 01-001(r)	Septic system	Yes	No	NFA granted (EPA 2005, 88464)
	AOC 01-001(v)	Septic system	Yes	No	NFA granted (EPA 2005, 88464)
	AOC 01-001(w)	Septic system	Yes	No	NFA granted (EPA 2005, 88464)
	AOC 01-003(c)	Surface disposal site	Yes	Yes	No sampling proposed
	SWMU 01-003(d)	Surface disposal site—can dump site	Yes	Yes	Investigation
	AOC 01-006(f)	Drainlines and outfall	Yes	No	NFA granted (EPA 2005, 88464)
	AOC 01-006(i)	Drainlines and outfall	Yes	No	NFA granted (EPA 2005, 88464)
	AOC 01-006(j)	Drainlines and outfall	Yes	No	NFA granted (EPA 2005, 88464)
	AOC 01-006(k)	Drainlines and outfall	Yes	No	NFA granted (EPA 2005, 88464)

Table 1.1-1 (continued)

Consolidated Unit	SWMU/AOC Number	Site Description	Site in HIR?	Site in Work Plan?	Site Status
	AOC 01-006(l)	Drainlines and outfall	Yes	No	NFA granted (EPA 2005, 88464)
	AOC 01-006(m)	Drainlines and outfall	Yes	No	NFA granted (EPA 2005, 88464)
	AOC 01-006(q)	Drainlines and outfall	Yes	No	NFA granted (EPA 2005, 88464)
	AOC 01-006(r)	Drainlines and outfall	Yes	No	NFA granted (EPA 2005, 88464)
	AOC 01-006(s)	Drainlines and outfall	Yes	No	NFA granted (EPA 2005, 88464)
	AOC 01-006(t)	Drainlines and outfall	Yes	No	NFA granted (EPA 2005, 88464)
	AOC 01-007(g)	Soil contamination area	Yes	No	NFA granted (EPA 2005, 88464)
	AOC 01-007(k)	Soil contamination area	Yes	Yes	Investigation
	AOC 01-007(n)	Soil contamination area	Yes	No	NFA granted (EPA 2005, 88464)
	AOC 01-007(p)	Soil contamination area	Yes	No	NFA granted (EPA 2005, 88464)
TA-03					
	AOC 03-001(m)	Satellite accumulation area	Yes	No	NFA granted (EPA 2005, 88464)
	AOC 03-008(a)	Firing site	Yes	Yes	No sampling proposed
	SWMU 03-009(b)	Surface disposal area	Yes	No	NFA granted (NMED 1998, 63042)
	SWMU 03-009(j)	Surface disposal site	Yes	Yes	Investigation
03-038(a)-00 Tanks and/or Associated Equipment	SWMU 03-038(a)	Acid tank	Yes	Yes	Investigation
	SWMU 03-038(b)	Acid tank	Yes	Yes	Investigation
	SWMU 03-055(c)	Outfall	Yes	Yes	Investigation
	SWMU 03-055(d)	Storm drain (active)	Yes	No	NFA granted (NMED 2001, 70010)
TA-30					
	AOC 30-001	Surface disposal and landfill	Yes	No	NFA granted (EPA 2005, 88464)
TA-32					
	SWMU 32-001	Incinerator (former location)	Yes	Yes	Investigation
	SWMU 32-002(a)	Septic tank (former location); drain lines	Yes	Yes	Investigation
	SWMU 32-002(b)	Septic system	Yes	Yes	Investigation
	AOC 32-003	Transformer site (former location)	Yes	Yes	Investigation

Table 1.1-1 (continued)

Consolidated Unit	SWMU/AOC Number	Site Description	Site in HIR?	Site in Work Plan?	Site Status
	AOC 32-004	Drain line and outfall	Yes	Yes	Investigation
	AOC C-32-001	Buildings	Yes	No	NFA granted (EPA 2005, 88464)
TA-41					
	SWMU 41-001	Septic system	Yes	Yes	Investigation
41-002(a)-99 TA-41 Sewage Treatment Plant	SWMU 41-002(a)	Imhoff tank	Yes	Yes	Deferred action proposed
	SWMU 41-002(b)	Chlorine contact tank	Yes	Yes	Deferred action proposed
	SWMU 41-002(c)	Sludge drying bed	Yes	Yes	Deferred action proposed
	AOC 41-003	Sump	Yes	Yes	Deferred action proposed
	AOC 41-004	Container storage	Yes	No	NFA granted (EPA 2005, 88464)
	AOC C-41-001	Duplicate of AOC 41-003	Yes	No	NFA granted (EPA 2005, 88464)
	AOC C-41-002	Underground tank	Yes	No	NFA granted (EPA 2005, 88464)
	AOC C-41-003	Underground tank	Yes	No	NFA granted (EPA 2005, 88464)
	AOC C-41-004	Storm drains	Yes	Yes	Deferred action proposed
	AOC C-41-005	Duplicate of C-41-003	Yes	No	NFA granted (EPA 2005, 88464)
TA-43					
	SWMU 43-001(a1)	Waste lines (pre-1981)	Yes	Yes	Deferred action proposed
	AOC 43-001(a2)	Waste lines (post-1981)	Yes	Yes	Deferred action proposed
	AOC 43-001(b1)	Outfall	Yes	No	NFA granted (EPA 2005, 88464)
	AOC 43-001(b2)	Outfall	Yes	Yes	Investigation
	SWMU 43-002	Incinerator	Yes	Yes	Deferred action proposed
	AOC 43-003	Carcass storage	Yes	No	NFA granted (EPA 2005, 88464)
	AOC 43-004	Waste storage	Yes	No	NFA granted (EPA 2005, 88464)
	AOC 43-005	Radioactive liquid storage	Yes	No	NFA granted (EPA 2005, 88464)
	AOC C-43-001	Storm drain outfall	Yes	Yes	Investigation
TA-61					
	AOC 61-004(b)	Septic tank	Yes	No	NFA granted (EPA 2005, 88464)
	SWMU 61-007	Transformer site systematic leak—PCB only site	Yes	Yes	Investigation

Note: Shading denotes consolidated units.

Attachment 3

Revised Figures

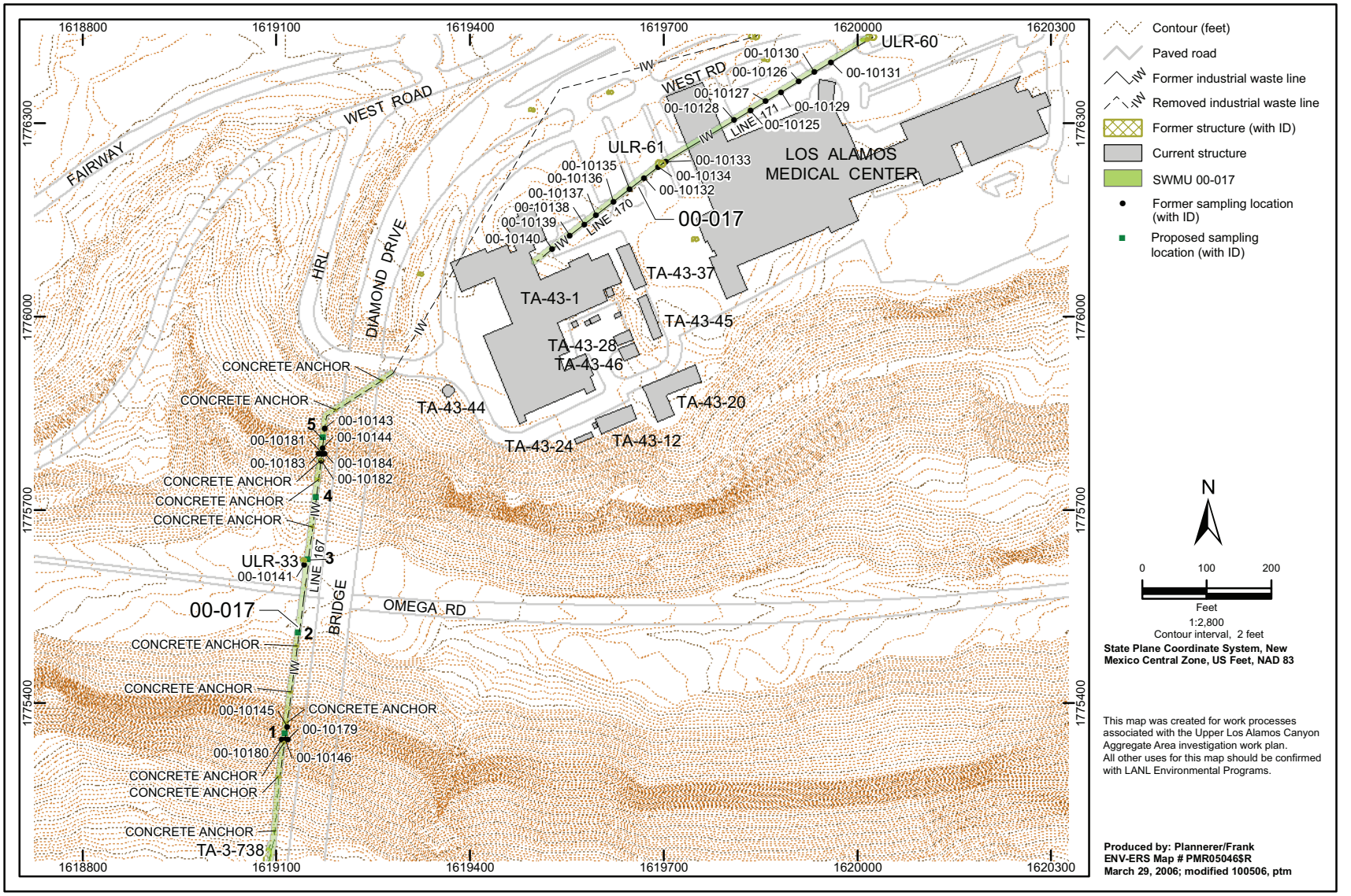


Figure 3.2-1. SWMU 00-017 site map and proposed sampling locations

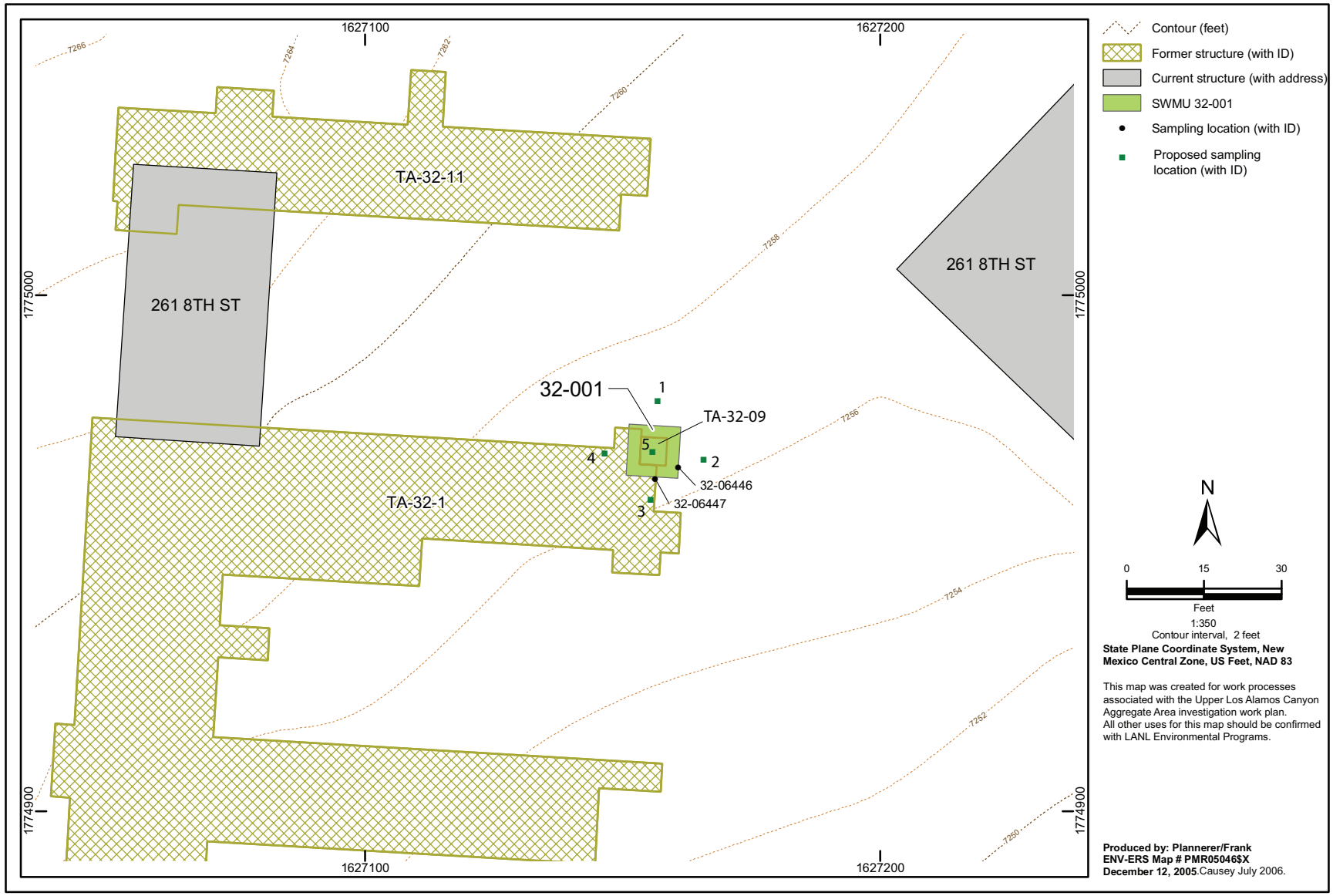


Figure 6.2-1. SWMU 32-001 site map and proposed sampling locations

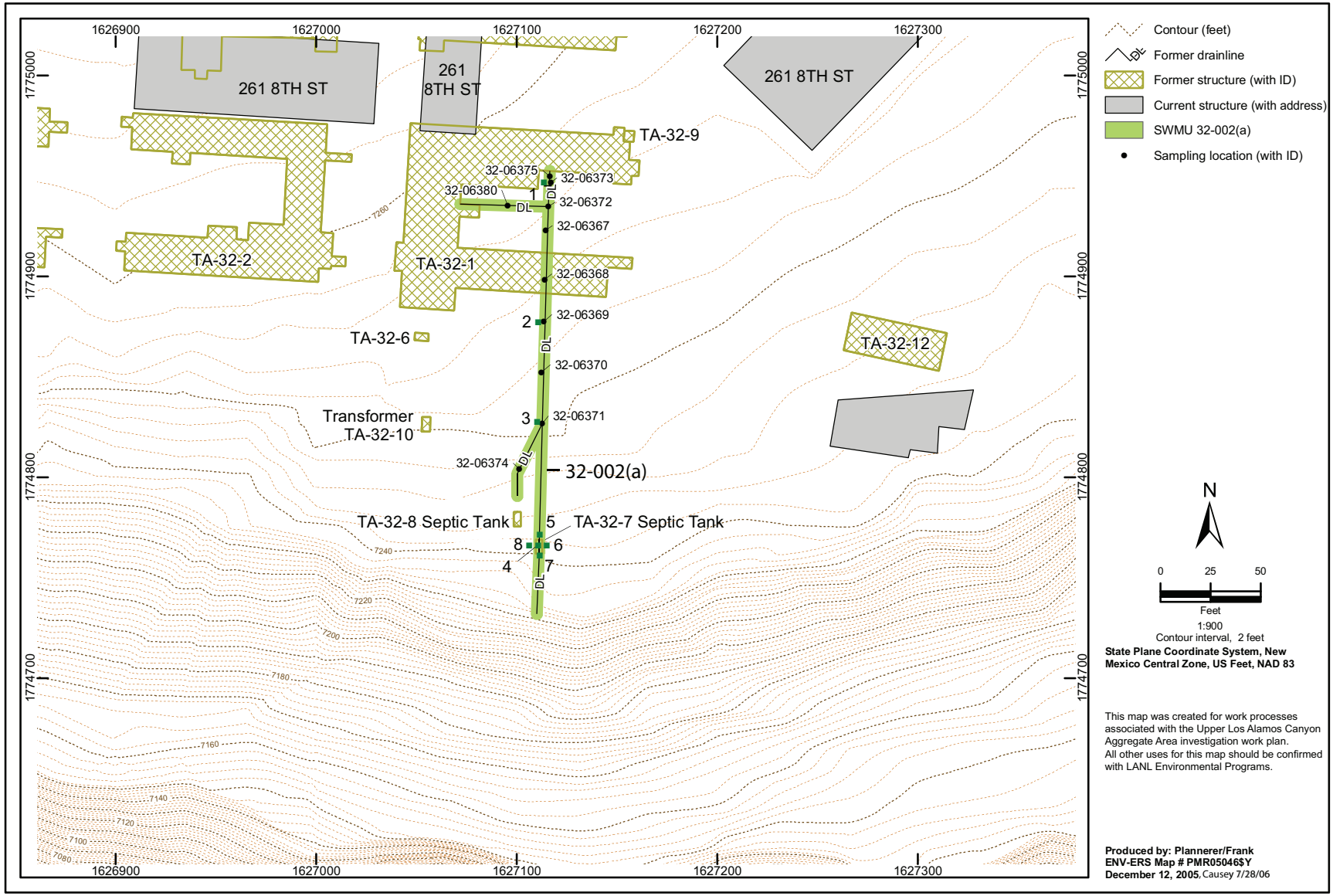


Figure 6.3-1. SWMU 32-002(a) site map and proposed sampling locations

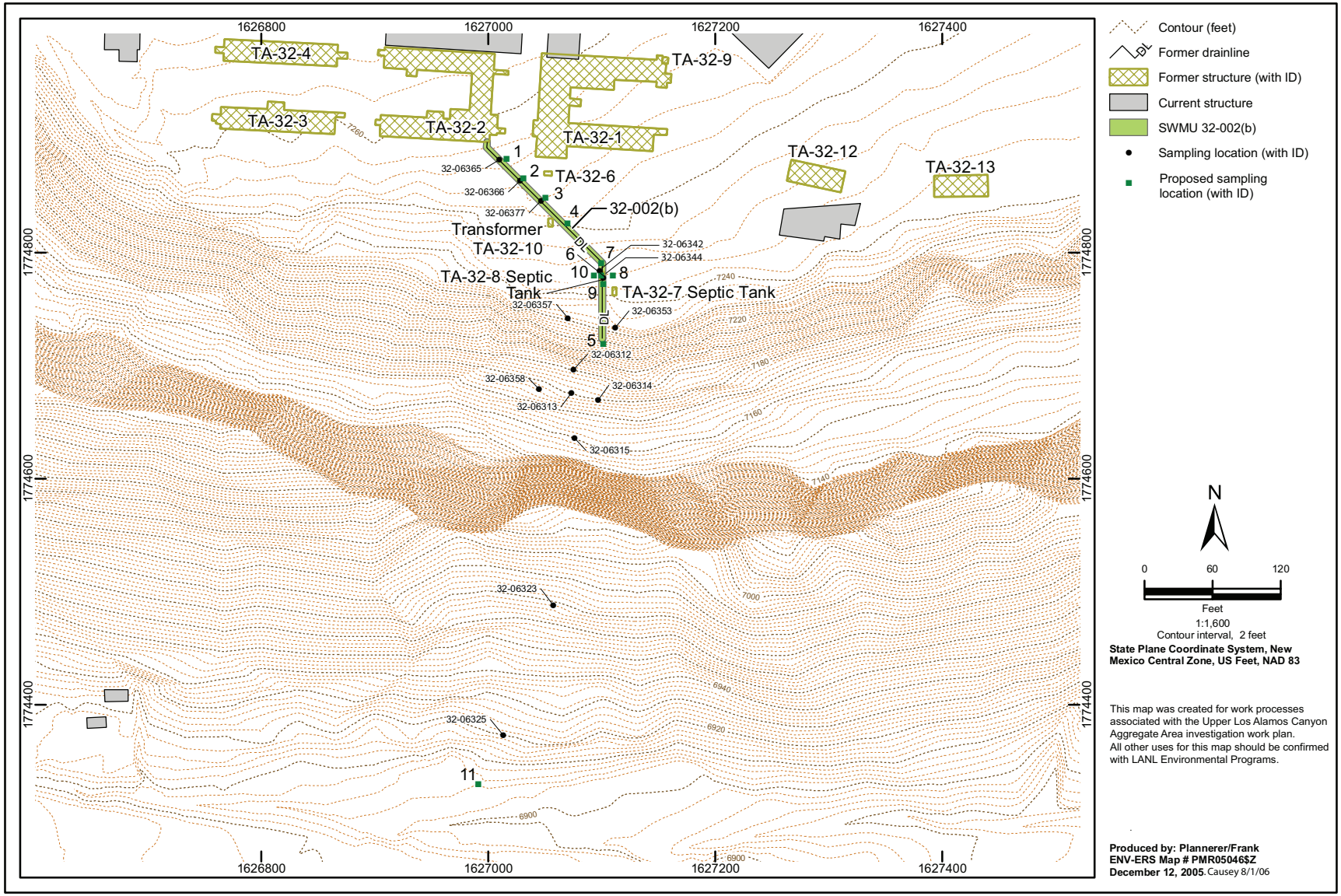


Figure 6.4-1. SWMU 32-002(b) site map and proposed sampling locations

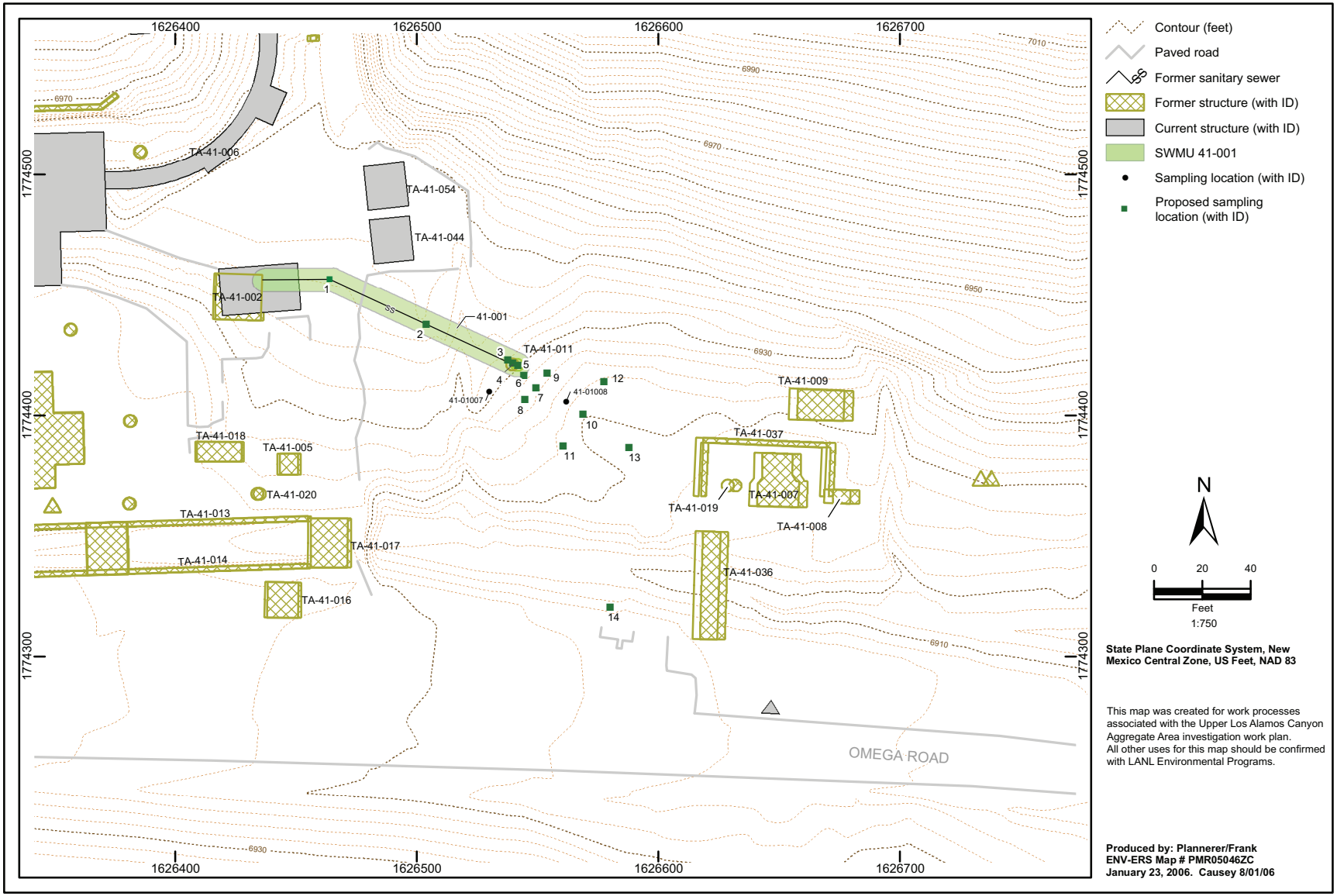


Figure 7.2-1. SWMU 41-001 site map and proposed sampling locations

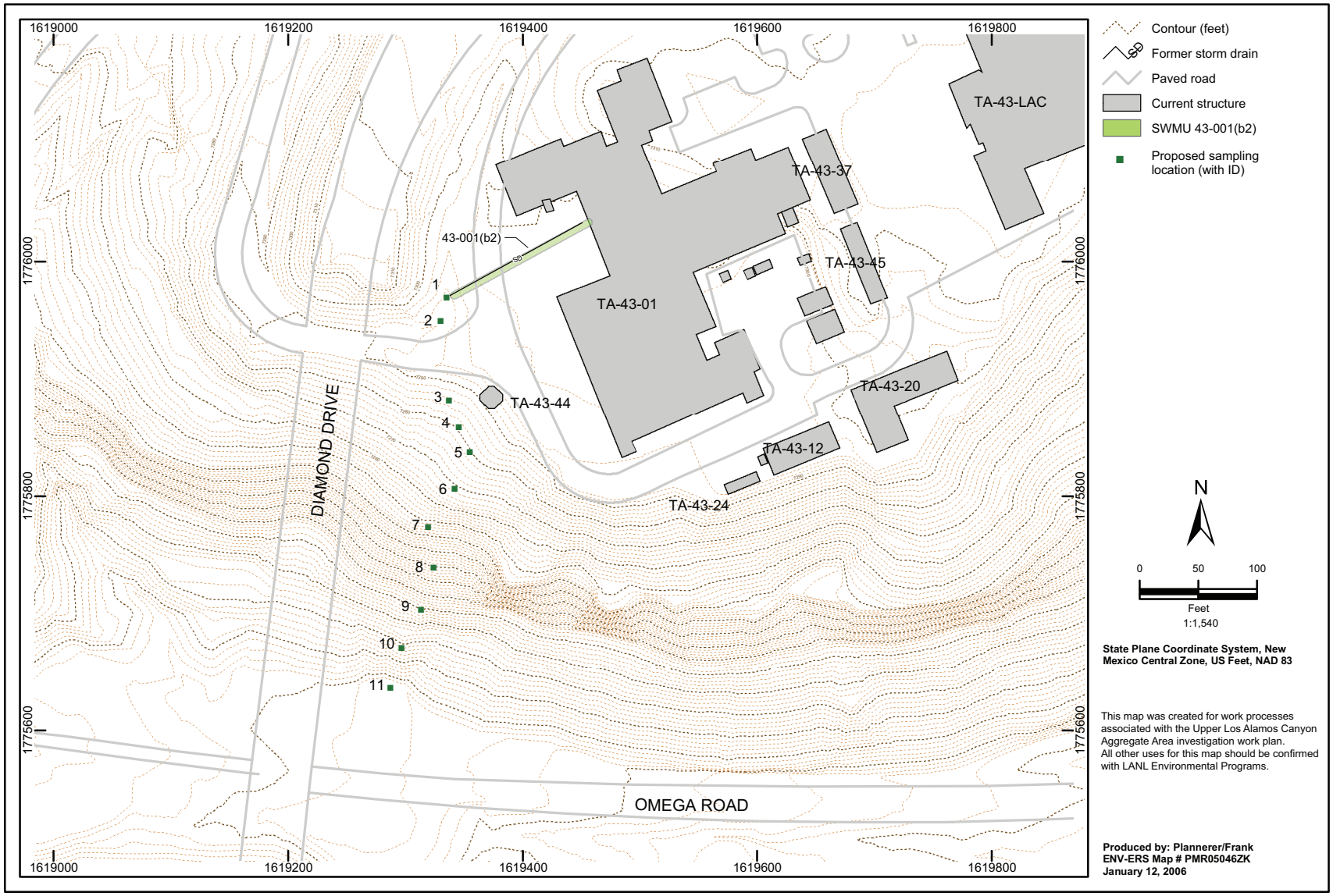
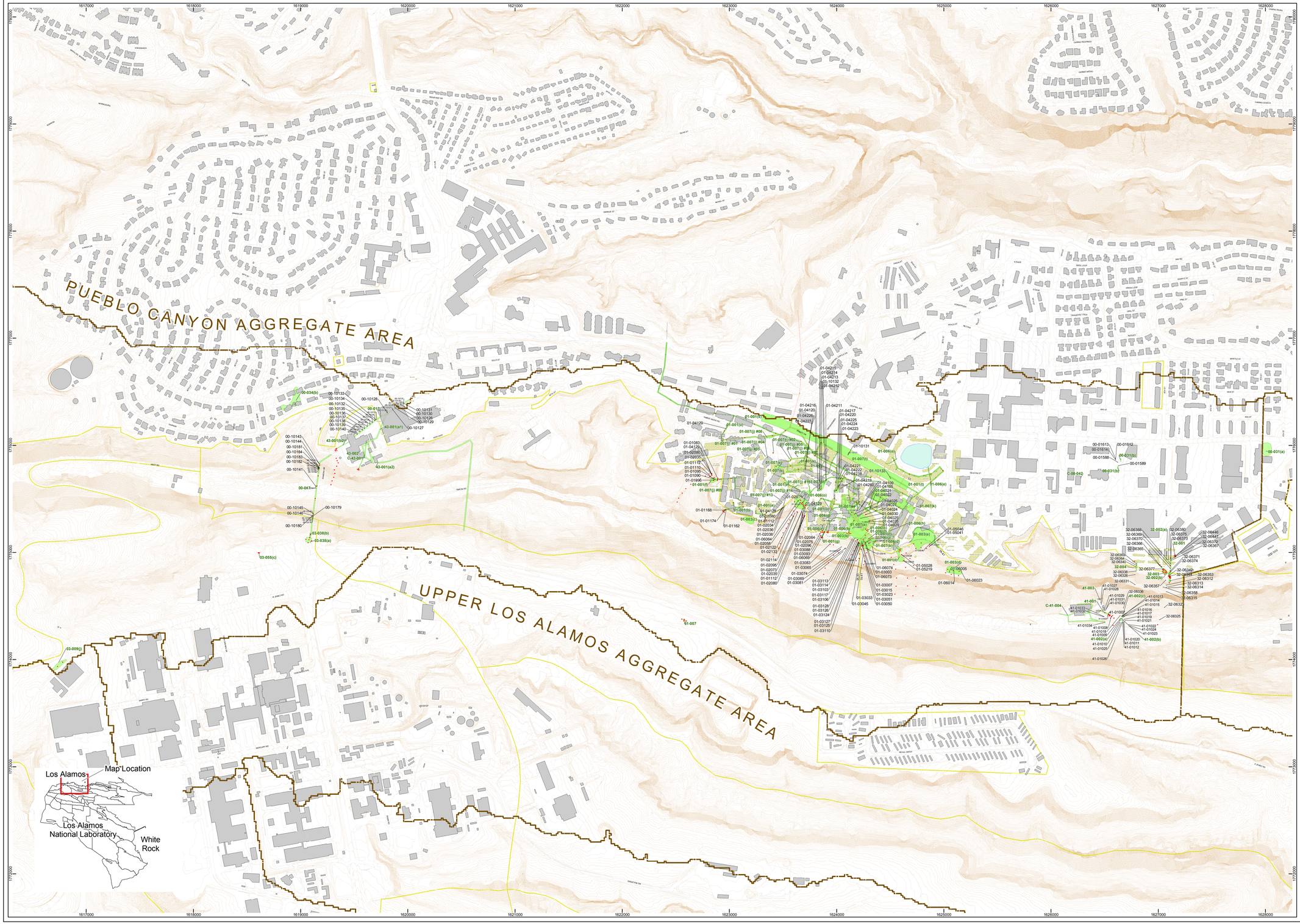


Figure 8.4-1. AOC 43-001(b2) site map and proposed sampling locations



- Proposed sample location
- Former sample location (with id)
- SWMU/AOC
- Contour (feet)
- Canyon rim (1990)
- Paved road
- Technical Area boundary
- Current structure
- Pond
- Former building drain line
- Former industrial waste line
- Former sanitary sewer
- Former storm drain
- Canyon rim (circa 1963)
- Former patrol road
- Former structure (with id)

DATA SOURCES

ENVIRONMENTAL FEATURE DATA
Former Location of the Canyon Rim, Townsite South Rim; ENV Environmental Restoration & Surveillance Program, Proposed feature class FRMRTA01_canyonrim_arc, PMR05046; 1:2,500 Scale Data; 21 June 2005.
Former Acid Sewer (Industrial Waste) Features of Technical Area (TA) 01; ENV Environmental Restoration & Surveillance Program, Proposed feature class FRMRTA01_acidsewer_arc, PMR05046; 1:2,500 Scale Data; 28 September 2005.
Former Building Drain Lines of Technical Area (TA) 01; ENV Environmental Restoration & Surveillance Program, Proposed feature class FRMRTA01_bldgdrainlines_arc, PMR05046; 1:2,500 Scale Data; 14 September 2005.
Former Patrol Road, South Canyon Rim, Technical Area (TA) 01; ENV Environmental Restoration & Surveillance Program, Polygon Features, Not Controlled, ER_notcontrolled_ply, edition 2006-08; 1:2,500 Scale Data; 27 January 2006.
Former Sanitary Sewer Features of Technical Area (TA) 01; ENV Environmental Restoration & Surveillance Program, Proposed feature class FRMRTA01_sanitarysewer_arc, PMR05046; 1:2,500 Scale Data; 20 September 2005.
Former Storm Drain Features of Technical Area (TA) 01; ENV Environmental Restoration & Surveillance Program, Proposed feature class FRMRTA01_stormdrain_arc, PMR05046; 1:2,500 Scale Data; 19 September 2005.
Former Structures of Technical Area (TA) 01; ENV Environmental Restoration & Surveillance Program, Proposed feature class FRMRTA01_structures_ply, PMR05046; 1:2,500 Scale Data; 21 June 2005.
Location of the Canyon Rim, Townsite South Rim in 1991; ENV Environmental Restoration & Surveillance Program, Proposed feature class ER_TA01_canyonrim1991_arc, PMR05046; 1:2,500 Scale Data; 21 June 2005.
Potential Release Sites; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program, Draft Changes for SUID CC05007; 1:2,500 Scale Data; 21 June 2005.

INFRASTRUCTURE & CULTURAL FEATURE DATA
Hypsography, 2, 10, 20 and 100 Foot Contour Intervals; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; 1991.
LANL Technical Areas; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; Development Edition of 05 January 2005.
Paved Road Arcs; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; Development Edition of 06 January 2005.
Ponds; County of Los Alamos, Information Services; 07 September 2004.
Structures; County of Los Alamos, Information Services; 08 September 2004.

N

0 370 740 1110 1480
Feet

1:5,170

State Plane Coordinate System, New Mexico Central Zone, US Feet, NAD 83

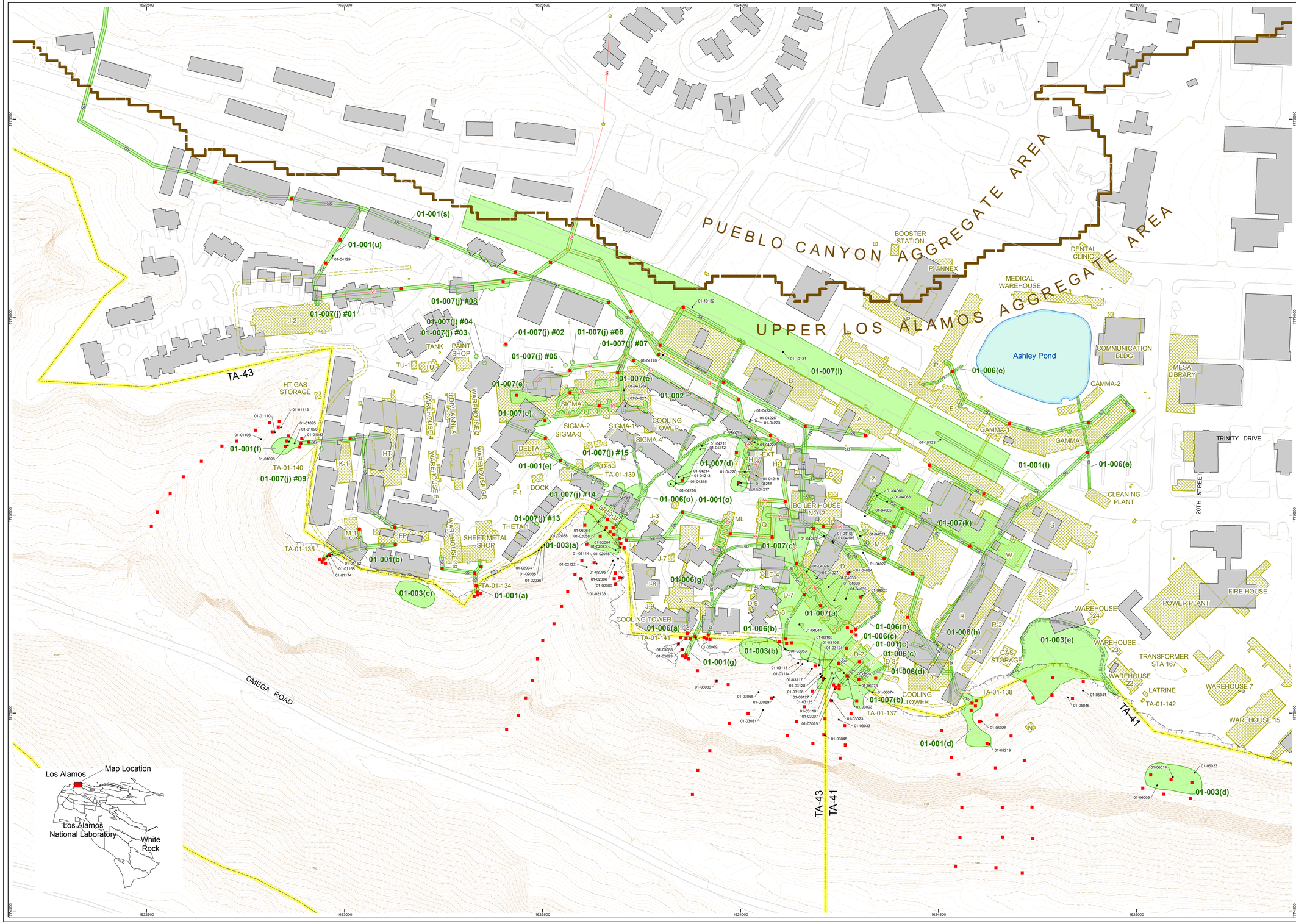
PLATE 1
UPPER LOS ALAMOS AGGREGATE AREA

LOS ALAMOS NATIONAL LABORATORY
Los Alamos, New Mexico 87545
22 February 2006

ENVIRONMENT & REMEDIATION
SUPPORT SERVICES

Map Number 06-0105-1
Created by Nicholas Plannerer
Revised by RedStar
9/08/2006
ERSS GIS Team

LA-UR-06-6608



- Proposed sample
- Potential Release Site
- Contour (feet)
- Canyon rim (1990)
- Paved road
- Technical Area boundary
- Current structure
- Pond
- Former building drain line
- Former industrial waste line
- Former sanitary sewer
- Former storm drain
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Former Building Drain Lines of Technical Area (TA) 01; ENV Environmental Restoration & Surveillance Program, Proposed feature class FRMRTA01_bldgdrainlines_arc, PMR05046; 1:2,500 Scale Data; 14 September 2005.
Former Patrol Road, South Canyon Rim, Technical Area (TA) 01; ENV Environmental Restoration & Surveillance Program, Polygon Features, Not Controlled, ER_notcontrolled_ply, edition 2006-08; 1:2,500 Scale Data; 27 January 2006.
Former Sanitary Sewer Features of Technical Area (TA) 01; ENV Environmental Restoration & Surveillance Program, Proposed feature class FRMRTA01_sanitarysewer_arc, PMR05046; 1:2,500 Scale Data; 20 September 2005.
Former Storm Drain Features of Technical Area (TA) 01; ENV Environmental Restoration & Surveillance Program, Proposed feature class FRMRTA01_stormdrain_arc, PMR05046; 1:2,500 Scale Data; 19 September 2005.
Former Structures of Technical Area (TA) 01; ENV Environmental Restoration & Surveillance Program, Proposed feature class FRMRTA01_structures_ply, PMR05046; 1:2,500 Scale Data; 21 June 2005.
Location of the Canyon Rim, Townsite South Rim in 1991; ENV Environmental Restoration & Surveillance Program, Proposed feature class ER_TA01_canyonrim1991_arc, PMR05046; 1:2,500 Scale Data; 21 June 2005.
Potential Release Sites; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program, Draft Changes for SUID CC05007; 1:2,500 Scale Data; 21 June 2005.

INFRASTRUCTURE & CULTURAL FEATURE DATA
Hypsography, 2, 10, 20 and 100 Foot Contour Intervals; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; 1991.
LANL Technical Areas; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; Development Edition of 05 January 2005.
Paved Road Arcs; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; Development Edition of 06 January 2005.
Ponds; County of Los Alamos, Information Services; 07 September 2004.
Structures; County of Los Alamos, Information Services; 08 September 2004.

N

0 100 200 300 400
Feet

1:1,400

State Plane Coordinate System, New Mexico Central Zone, US Feet, NAD 83

PLATE 2
TA-01 FORMER AND PROPOSED SAMPLE LOCATIONS

LOS ALAMOS NATIONAL LABORATORY
Los Alamos, New Mexico 87545
22 February 2006

ENVIRONMENTAL REMEDIATION & SURVEILLANCE PROGRAM

Map Number PMR05046ZS
Created by Nicholas Plannerer
Revised by Dave Frank
8/24/2006
ERSS GIS Team

DISCLAIMER: This map was created for work processes associated with the Environment & Remediation Support Services division. All other uses for this map should be confirmed with LANL EP-ERSS staff.

LA-UR-06-5654

PLATE 3
STATUS OF INDUSTRIAL WASTE LINES IN UPPER LOS ALAMOS AND PUEBLO CANYON AGGREGATE AREAS

LA-UR-06-6971

Los Alamos National Laboratory
Environment and Remediation Support Services Division
GIS / Geotechnical Services Group
Los Alamos, New Mexico 87545

MAP NUMBER PMR06049-A1
Nicholas Plannerer 27 September 2006

Radioactive Liquid Waste Line

- Line Removed
- Line Abandoned in Place
- Status of Line Unknown

- Edge of Road, 2006
- Former Structure
- Aggregate Area Boundary

Orthophotograph of the Los Alamos Site 2005

N S W E

0 250 500
Feet
1:2,400

State Plane Coordinate System, New Mexico, Central Zone, US Ft
North American Datum 1983

DATA SOURCES

Aggregate Areas; Los Alamos National Laboratory, ENV Environmental Remediation & Surveillance Program, ER2005-0496; 1:2,500 Scale Data; 22 September 2005.

Former Structures of TA-01, TA-43 and TA-45; Los Alamos National Laboratory, Environment and Remediation Support Services Division, GIS/Geotechnical Services Group, Preliminary Spatial Feature Data; 1:2,500 Scale Data; 18 September 2006.

Spatial Feature Representation of the Abandoned Radioactive Liquid Waste Lines of TA-01, TA-43, TA-45, Townsite and Portions of TA-03; Los Alamos National Laboratory, Environment and Remediation Support Services Division, GIS/Geotechnical Services Group; Document Catalog Number EP2006-0888; 1:2,500 Scale Data; 27 September 2006.

Streets; County of Los Alamos, Information Services; as published 16 May 2006.

Orthophotography, Los Alamos National Laboratory Site, 2005; Los Alamos National Laboratory, Site Planning and Project Initiation Group, Space and Site Management Office; LA-UR-05-9035, 17 October 2005.

INDEX MAP
LOS ALAMOS NATIONAL LABORATORY